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Form 6-K
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FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Report of Foreign Private Issuer

Pursuant to Rule 13a - 16 or 15d - 16 of

the Securities Exchange Act of 1934

Commission File Number: 001-14930

For the month of February 2018

HSBC Holdings plc

42nd Floor, 8 Canada Square, London E14 5HQ, England

(Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F).

Form 20-F Form 40-F

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1):

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Yes No

(If "Yes" is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b): 82-).

Pillar 3 Disclosures at 31 December 2017

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Unless the context requires otherwise, 'HSBC Holdings' means HSBC Holdings plc and 'HSBC', the 'Group', 'we', 'us' and 'our' refer to HSBC Holdings together with its subsidiaries. Within this document the Hong Kong Special Administrative Region of the People's Republic of China is referred to as 'Hong Kong'. When used in the terms 'shareholders' equity' and 'total shareholders' equity', 'shareholders' means holders of HSBC Holdings ordinary shares and those preference shares and capital securities issued by HSBC Holdings classified as equity. The abbreviations '\$m' and '\$bn' represent millions and billions (thousands of millions) of US dollars respectively.

1 HSBC Holdings plc Pillar 3 2017

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Pillar 3 Disclosures at 31 December 2017

Introduction

Table 1: Key metrics

| | At 31 Dec |
|---|----------------|
| | Footnotes 2017 |
| Available capital (\$bn) | 1 |
| 1 Common equity tier 1 ('CET1') capital | 126.1 |
| 2 Tier 1 capital | 151.0 |
| 3 Total regulatory capital | 182.4 |
| Risk-weighted assets ('RWAs') (\$bn) | |
| 4 Total RWAs | 871.3 |
| Capital ratios (%) | |
| 5 CET1 | 14.5 |
| 6 Total tier 1 | 17.3 |
| 7 Total capital | 20.9 |
| Additional CET1 buffer requirements as a percentage of RWA (%) | |
| 8 Capital conservation buffer requirement | 1.25 |
| 9 Countercyclical buffer requirement | 0.22 |
| 10 Bank G-SIB and/or D-SIB additional requirements | 1.25 |
| 11 Total of bank CET1 specific buffer requirements | 2.72 |
| 12 CET1 available after meeting the bank's minimum capital requirements | 8.0 |
| Leverage ratio | |
| 13 Total leverage ratio exposure measure (\$bn) | 2,557.1 |
| 14 Leverage ratio (%) | 2 5.6 |
| Liquidity Coverage Ratio ('LCR') | |
| 15 Total high-quality liquid assets (\$bn) | 512.6 |
| 16 Total net cash outflow (\$bn) | 359.9 |
| 17 LCR ratio (%) | 3 142.2 |

1 Capital figures are reported on a transitional basis.

2 Leverage ratio is calculated on a fully phased-in basis.

3 LCR ratio is calculated as at 31 December 2017.

Regulatory framework for disclosures

HSBC is supervised on a consolidated basis in the United Kingdom ('UK') by the Prudential Regulation Authority ('PRA'), which receives information on the capital adequacy of, and sets capital requirements for, the Group as a whole. Individual banking subsidiaries are directly regulated by their local banking supervisors, who set and monitor their local capital adequacy requirements. In most jurisdictions, non-banking financial subsidiaries are also subject to the supervision and capital requirements of local regulatory authorities.

At a consolidated group level, we calculated capital for prudential regulatory reporting purposes throughout 2017 using the Basel III framework of the Basel Committee ('Basel') as implemented by the European Union ('EU') in the amended Capital Requirements Directive and Regulation ('CRD IV'), and in the PRA's Rulebook for the UK banking industry. The regulators of Group banking entities outside the EU are at varying stages of implementation of the Basel

Committee's framework, so local regulation in 2017 may have been on the basis of Basel I, II or III.

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

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

The PRA's final rules adopted national discretions in order to accelerate significantly the transition timetable to full 'end point' CRD IV compliance.

Pillar 3 disclosures

HSBC's Pillar 3 disclosures at December 2017 comprise all information required under Pillar 3, both quantitative and qualitative. They are made in accordance with Part 8 of the Capital Requirements Regulation within CRD IV and the European Banking Authority's ('EBA') final standards on revised Pillar 3 disclosures issued in December 2016. These disclosures are supplemented by specific additional requirements of the PRA and discretionary disclosures on our part.

The Pillar 3 disclosures are governed by the Group's disclosure policy framework as approved by the Group Audit Committee ('GAC'). Information relating to the rationale for withholding certain disclosures is provided in Appendix III.

In our disclosures, to give insight into movements during the year, we provide comparative figures for the previous year, analytical review of variances and 'flow' tables for capital requirements.

Key ratios and figures are reflected throughout the Pillar 3 disclosures at December 2017 and a summary is presented in Table 1. Where disclosures have been enhanced, or are new, we do not generally restate or provide prior year comparatives. The capital resources tables track the position from a CRD IV transitional to an end point basis.

We publish comprehensive Pillar 3 disclosures annually on the HSBC website www.hsbc.com, concurrently with the release of our Annual Report and Accounts 2017. A separate Pillar 3 document is also published at half-year following our Interim Report disclosure. Quarterly earnings releases also include regulatory information in line with the new requirements on the frequency of regulatory disclosures.

Pillar 3 requirements may be met by inclusion in other disclosure media. Where we adopt this approach, references are provided to the relevant pages of the Annual Report and Accounts 2017 or other locations.

We continue to engage in the work of the UK authorities and industry associations to improve the transparency and comparability of UK banks' Pillar 3 disclosures.

Regulatory developments

Basel Committee

In December, the Basel Committee ('Basel') published the revisions to the Basel III framework (sometimes referred to as 'Basel IV'). The final package includes:

- widespread changes to the risk weights under the standardised approach to credit risk;
 - a change in the scope of application of the internal ratings based ('IRB') approach to credit risk, together with changes to the IRB methodology;
 - the replacement of the operational risk approaches with a single methodology;
 - an amended set of rules for the credit valuation adjustment ('CVA') capital framework;
 - an aggregate output capital floor that ensures that banks' total risk-weighted assets are no lower than 72.5% of those generated by the standardised approaches; and
- changes to the exposure measure for the leverage ratio, together with the imposition of a leverage ratio buffer for global systemically important institutions ('G-SIB'). This will take the form of a tier 1 capital buffer set at 50% of the G-SIB's RWAs capital buffer.

Basel has announced that the package will be implemented on 1 January 2022, with a five-year transitional provision for the output floor from that date, commencing at a rate of 50%.

HSBC is currently evaluating the final package. Given that the package contains a significant number of national discretions and that Basel has committed to re-calibrate the market risk elements

of the final framework during 2018, significant uncertainty remains as to the impact.

In all instances, the final standards will have to be transposed into the relevant local law before coming into effect. In addition, during 2017, Basel proposed other revisions to the regulatory capital framework. In particular, it published:

- a discussion paper on the treatment of sovereign exposures;
 - the final guidelines regarding the identification and management of step-in risk;
 - the interim regulatory treatment and transitional requirements for International Financial Reporting Standard 9, Financial Instruments ('IFRS 9') provisions;
 - the final phase 2 Pillar 3 standards;
 - and
- proposals to revise the G-SIB assessment framework.

Financial Stability Board

In July, the Financial Stability Board ('FSB') expanded its resolution reform policy framework with the publication of its 'Guiding Principles on the Internal Total Loss-absorbing Capacity of G-SIBs ('Internal TLAC')'. These guidelines supplement the FSB's TLAC standard published in November 2015. In addition, the FSB published consultations on other outstanding issues related to its resolution framework. Again, these need to be incorporated into the relevant local law before coming into effect.

European Union

In the EU, elements of Basel's and the FSB's reforms are being implemented through revisions to the Capital Requirements Regulation and Capital Requirements Directive (collectively referred to as 'CRR2') and the EU resolution framework. The key components of CRR2 include changes to the market risk framework under the Fundamental Review of the Trading Book, changes to the counterparty credit risk framework and a binding leverage ratio. It also includes details of the minimum requirements for TLAC, which in the EU is known as the 'Minimum Requirements for own funds and Eligible Liabilities' ('MREL'). The CRR2 changes are expected to be finalised in 2018 and apply from 1 January 2021, although certain elements, such as MREL, are expected to apply from 1 January 2019. In December, the EU's IFRS 9 transitional capital arrangements were published formally and the EBA published its final guidelines on the IFRS 9 disclosures. Separately, the final changes to the capital rules on securitisation were also published formally by the EU with implementation expected on 1 January 2019 for new transactions and on 1 January 2020 for existing positions. In addition, during 2017, the EBA published a consultation on the methods of prudential consolidation under the EU's rules.

Also in December, in line with the EU's rules, the requirement to have a Basel I floor lapsed and the PRA confirmed that its application is no longer required. A new output floor will be implemented as part of the Basel IV amendments.

Bank of England

In March, HSBC received from the Bank of England ('BoE') its indicative MREL requirement applicable to HSBC Holdings plc and its European Resolution Group (comprised of HSBC Bank plc and its subsidiaries). This includes interim MREL requirements effective from 1 January 2019 and final requirements effective from 1 January 2022. The BoE also confirmed formally that 'multiple-point-of-entry' ('MPE') is the preferred resolution strategy for HSBC. In May, the BoE published the quantum of MREL requirements for major UK banks.

In addition, during 2017, the BoE and the PRA proposed other revisions to the regulatory capital and MREL frameworks. In particular, they published proposals and/or final rules setting out:

- the approach to setting internal MREL and the setting of MREL for MPE groups;
- the interaction of MREL with both the capital and leverage ratio buffers;
- changes to the groups and double leverage policy;
- the policy refining the PRA's Pillar 2A capital requirements and disclosure; and
- the policy to ensure that valuation processes do not impede resolvability.

The PRA also published its final rules on the exclusion of claims on central banks from the UK leverage ratio framework and the re-calibration of the minimum leverage ratio for HSBC from 3% to 3.25% of tier 1 capital. These changes took effect in October 2017.

Lastly, in June, the Financial Policy Committee raised the countercyclical buffer rate for UK exposures to 0.5%, to apply from June 2018 and in November, increased it further to 1% with binding effect from November 2018.

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 the HSBC Values and our Global Standards programme. The framework fosters continuous monitoring of the risk environment, and an integrated evaluation of risks and their interactions. It also ensures 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 106 of the Annual Report and Accounts 2017. The management and mitigation of principal risks facing the Group is described in our top and emerging risks on page 95 of the Annual Report and Accounts 2017. Commentary on hedging strategies and associated processes can be found in the Market risk and Securitisation sections of this document. Additionally, a comprehensive overview of this topic can be found in Note 1.2(e) on page 227 of the Annual Report and Accounts 2017.

Risk culture

HSBC has 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 the 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 the HSBC Values and the achievement of financial and non-financial objectives that are aligned to our risk appetite and strategy.

Further information on risk and remuneration is set out on pages 95 and 203 of the Annual Report and Accounts 2017.

Risk governance

The Board has ultimate responsibility for the effective management of risk and approves HSBC's risk appetite. It is advised on risk-related matters by the Group Risk Committee ('GRC'), the Financial System Vulnerabilities Committee ('FSVC') and the Conduct and Values Committee ('CVC'). The activities of the GRC, FSVC and CVC are set out on pages 175 to 177 of the Annual Report and Accounts 2017.

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 Chief Risk Officer. He is supported by the Risk Management Meeting ('RMM') of the Group Management Board.

Pillar 3 Disclosures at 31 December 2017

The management of financial crime risk resides with the Group Head of Financial Crime Risk. He is supported by the Financial Crime Risk Management Meeting, as described on page 118 of the Annual Report and Accounts 2017. Day-to-day responsibility for risk management is delegated to senior managers with individual accountability for decision making. These senior managers are supported by global functions. 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 (see page 107 of the Annual Report and Accounts 2017).

Our executive risk governance structures ensure appropriate oversight and accountability for risk, which facilitates the reporting and escalation to the RMM (see page 107 of the Annual Report and Accounts 2017).

Risk appetite

Risk appetite is a key component of our management of risk. It describes the aggregate level and risk types that we are willing to accept in achieving our medium to long-term business objectives. In HSBC, risk appetite is managed through a global risk appetite framework and articulated in a risk appetite statement ('RAS'), which is approved biannually by the Board on the advice of the GRC.

The Group's risk appetite informs our strategic and financial planning process, defining the desired forward-looking risk profile of the Group. It is also integrated within other risk management tools, such as the top and emerging risks report and stress testing, to ensure consistency in risk management. Information on our risk management tools is set out on page 107 of the Annual Report and Accounts 2017. Details on the Group's overarching risk appetite are set out on page 95 of the Annual Report and Accounts 2017.

Stress testing

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

Our testing programme assesses our capital strength and enhances our resilience to external shocks. It also helps us understand and mitigate risks, and informs our decision about capital levels. As well as taking part in regulatory driven stress tests, we conduct our own internal stress tests.

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

Further information on stress testing and details of the Group's regulatory stress test results are set out on page 109 of the Annual Report and Accounts 2017.

Global Risk function

We have a dedicated Global Risk function, headed by the Group Chief Risk Officer, which is responsible for the Group's risk management framework. This includes establishing global policy, monitoring risk profiles, and forward-looking risk identification and management. Global Risk is made up of sub-functions covering all risks to our operations. It is independent from the global businesses, including sales and trading functions, helping to ensure balance in risk/return decisions. The Global Risk function operates in line with the three lines of defence model (see page 107 of the Annual Report and Accounts 2017).

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 GAC has responsibility for oversight of risk management and internal controls over financial reporting, and the GRC has responsibility for oversight of risk management and internal controls other than for financial reporting.

The Directors, through the GRC and the GAC, conduct an annual review of the effectiveness of our system of risk management and internal control. The GRC and the GAC 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.

HSBC's key risk management and internal control procedures are described on page 178 of the Annual Report and Accounts 2017, where the Directors' Report on the effectiveness of internal controls can also be found.

Risk measurement and reporting systems

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

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

We continue to invest significant resources in IT systems and processes in order to maintain and improve our risk management capabilities. A number of key initiatives and projects to enhance consistent data aggregation, reporting and management, and work towards meeting our Basel Committee data obligations are in progress. Group policy promotes the deployment of preferred technology where practicable. Group standards govern the procurement and operation of systems used in 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, region 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 Global Risk function manages 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. It formulates technical responses to industry developments and regulatory policy in the field of risk analytics, develops HSBC's global risk models, and oversees local model development and use around the Group toward our implementation targets for IRB approaches.

Model governance is under the general oversight of the Global Model Oversight Committee ('MOC'). The Global MOC is supported by specific global functional MOCs for wholesale credit risk, market risk, Retail Banking and Wealth Management ('RBWM'), Global Private Banking ('GPB'), Finance, regulatory compliance, operational risk, fraud risk and financial intelligence, pensions risk and financial crime risk, and has functional and/or regional and entity-level counterparts with comparable terms of reference where required.

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The Global MOC meets regularly and reports to RMM. It is chaired by the Global Risk function, and its membership is drawn from Risk, Finance and global 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 Group, and to oversee the governance of our risk rating models, their consistency and approval, within the regulatory framework. Through its oversight of the functional MOCs, 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 on any material model-related issues.

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

The development and use of data and models to meet local requirements are the responsibility of global businesses or functions, as well as regional and/or local entities under the governance of their own management, subject to overall Group policy and oversight.

Linkage to the Annual Report and Accounts

2017

Structure of the regulatory group

Subsidiaries engaged in insurance activities are excluded from the regulatory consolidation by excluding assets, liabilities and post-acquisition reserves. The Group's investments in these insurance subsidiaries are recorded at cost and deducted from CET1 capital (subject to thresholds).

The regulatory consolidation also excludes special purpose entities ('SPEs') where significant risk has been transferred to third parties. Exposures to these SPEs are risk-weighted as securitisation positions for regulatory purposes.

Participating interests in banking associates are proportionally consolidated for regulatory purposes by including our share of assets, liabilities, profit and loss, and risk-weighted assets in accordance with the PRA's application of EU legislation. Non-participating significant investments, along with non-financial associates, are deducted from capital (subject to thresholds).

Table 2: Reconciliation of balance sheets – financial accounting to regulatory scope of consolidation

| | Accounting balance sheet Ref \$m | Deconsolidation of insurance/ other entities \$m | Consolidation of banking associates \$m | Regulatory balance sheet \$m |
|---|---|---|--|---------------------------------------|
| Assets | | | | |
| Cash and balances at central banks | 180,624 | (38 |)1,174 | 181,760 |
| Items in the course of collection from other banks | 6,628 | — | 2 | 6,630 |
| Hong Kong Government certificates of indebtedness | 34,186 | — | — | 34,186 |
| Trading assets | 287,995 | (359 |)1 | 287,637 |
| Financial assets designated at fair value | 29,464 | (28,674 |)— | 790 |
| Derivatives | 219,818 | (128 |)57 | 219,747 |
| Loans and advances to banks | 90,393 | (2,024 |)1,421 | 89,790 |
| Loans and advances to customers | 962,964 | (3,633 |)12,835 | 972,166 |
| – of which: impairment allowances on IRB portfolios h | (5,004 |)— | — | (5,004 |
| Reverse repurchase agreements – non-trading | 201,553 | — | 1,854 | 203,407 |
| Financial investments | 389,076 | (61,480 |)3,325 | 330,921 |
| Capital invested in insurance and other entities | — | 2,430 | — | 2,430 |
| Prepayments, accrued income and other assets | 67,191 | (4,202 |)267 | 63,256 |
| – of which: retirement benefit assets | i 8,752 | — | — | 8,752 |
| Current tax assets | 1,006 | (5 |)— | 1,001 |
| Interests in associates and joint ventures | 22,744 | (370 |)4,064 |)18,310 |
| – of which: positive goodwill on acquisition | e 521 | (14 |)1 |)506 |

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| | | | | | |
|--------------------------------|---|-----------|----------|---------|-----------|
| Goodwill and intangible assets | e | 23,453 | (6,937 |)— | 16,516 |
| Deferred tax assets | f | 4,676 | 170 | — | 4,846 |
| Total assets at 31 Dec 2017 | | 2,521,771 | (105,250 |)16,872 | 2,433,393 |

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Pillar 3 Disclosures at 31 December 2017

| | Ref † | Accounting balance sheet \$m | Deconsolidation of insurance/ other entities \$m | Consolidation of banking associates \$m | Regulatory balance sheet \$m |
|---|---------------|---------------------------------------|---|--|---------------------------------------|
| Liabilities and equity | | | | | |
| Liabilities | | | | | |
| Hong Kong currency notes in circulation | | 34,186 | — | — | 34,186 |
| Deposits by banks | | 69,922 | (86 |)695 | 70,531 |
| Customer accounts | | 1,364,462 | (64 |)14,961 | 1,379,359 |
| Repurchase agreements – non-trading | | 130,002 | — | — | 130,002 |
| Items in course of transmission to other banks | | 6,850 | — | — | 6,850 |
| Trading liabilities | | 184,361 | 867 | — | 185,228 |
| Financial liabilities designated at fair value | | 94,429 | (5,622 |)— | 88,807 |
| – of which: | | | | | |
| included in tier 1 | m | 459 | — | — | 459 |
| included in tier 2 | n, q | 23,831 | — | — | 23,831 |
| Derivatives | | 216,821 | 69 | 51 | 216,941 |
| Debt securities in issue | | 64,546 | (2,974 |)320 | 61,892 |
| Accruals, deferred income and other liabilities | | 45,907 | (211 |)622 | 46,318 |
| Current tax liabilities | | 928 | (81 |)— | 847 |
| Liabilities under insurance contracts | | 85,667 | (85,667 |)— | — |
| Provisions | | 4,011 | (17 |)223 | 4,217 |
| – of which: credit-related contingent liabilities and contractual commitments on IRB portfolios | h | 220 | — | — | 220 |
| Deferred tax liabilities | | 1,982 | (1,085 |)— | 897 |
| Subordinated liabilities | | 19,826 | 1 | — | 19,827 |
| – of which: | | | | | |
| included in tier 1 | k, m | 1,838 | — | — | 1,838 |
| included in tier 2 | n, o, q | 17,561 | — | — | 17,561 |
| Total liabilities at 31 Dec 2017 | | 2,323,900 | (94,870 |)16,872 | 2,245,902 |
| Equity | | | | | |
| Called up share capital | a | 10,160 | — | — | 10,160 |
| Share premium account | a, k | 10,177 | — | — | 10,177 |
| Other equity instruments | j, k | 22,250 | — | — | 22,250 |
| Other reserves | c, g | 7,664 | 1,236 | — | 8,900 |
| Retained earnings | b, c | 139,999 | (10,824 |)— | 129,175 |
| Total shareholders' equity | | 190,250 | (9,588 |)— | 180,662 |
| Non-controlling interests | d, l, m, p | 7,621 | (792 |)— | 6,829 |
| – of which: non-cumulative preference shares issued by subsidiaries | m | — | — | — | — |
| included in tier 1 capital | | | | | |
| Total equity at 31 Dec 2017 | | 197,871 | (10,380 |)— | 187,491 |
| Total liabilities and equity at 31 Dec 2017 | | 2,521,771 | (105,250 |)16,872 | 2,433,393 |

† The references (a) – (q) identify balance sheet components that are used in the calculation of regulatory capital on page 14.

Table 2: Reconciliation of balance sheets – financial accounting to regulatory scope of consolidation (continued)

Accounting Deconsolidation Consolidation Regulatory

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| | balance sheet Ref \$m | of insurance/ other entities \$m | of banking associates \$m | balance sheet \$m |
|---|-----------------------------|--|---------------------------------|-------------------------|
| Assets | | | | |
| Cash and balances at central banks | 128,009 | (27 |)1,197 | 129,179 |
| Items in the course of collection from other banks | 5,003 | — | 26 | 5,029 |
| Hong Kong Government certificates of indebtedness | 31,228 | — | — | 31,228 |
| Trading assets | 235,125 | (198 |)1 | 234,928 |
| Financial assets designated at fair value | 24,756 | (24,481 |)— | 275 |
| Derivatives | 290,872 | (145 |)77 | 290,804 |
| Loans and advances to banks | 88,126 | (1,845 |)922 | 87,203 |
| Loans and advances to customers | 861,504 | (3,307 |)12,897 | 871,094 |
| – of which: impairment allowances on IRB portfolios h | (5,096 |)— | — | (5,096) |
| Reverse repurchase agreements – non-trading | 160,974 | 344 | 1,444 | 162,762 |
| Financial investments | 436,797 | (54,904 |)3,500 | 385,393 |
| Capital invested in insurance and other entities | — | 2,214 | — | 2,214 |
| Prepayments, accrued income and other assets | 63,909 | (3,073 |)306 | 61,142 |
| – of which: retirement benefit assets | i 4,714 | — | — | 4,714 |
| Current tax assets | 1,145 | (118 |)— | 1,027 |
| Interests in associates and joint ventures | 20,029 | — | (4,195 |)15,834 |
| – of which: positive goodwill on acquisition | e 488 | — | (475 |)13 |
| Goodwill and intangible assets | e 21,346 | (6,651 |)481 | 15,176 |
| Deferred tax assets | f 6,163 | 176 | 5 | 6,344 |
| Total assets at 31 Dec 2016 | 2,374,986 | (92,015 |)16,661 | 2,299,632 |

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| | Ref † | Accounting balance sheet \$m | Deconsolidation of insurance/ other entities \$m | Consolidation of banking associates \$m | Regulatory balance sheet \$m |
|---|---------------|---------------------------------------|---|--|---------------------------------------|
| Liabilities and equity | | | | | |
| Liabilities | | | | | |
| Hong Kong currency notes in circulation | | 31,228 | — | — | 31,228 |
| Deposits by banks | | 59,939 | (50 |)441 | 60,330 |
| Customer accounts | | 1,272,386 | (44 |)14,997 | 1,287,339 |
| Repurchase agreements – non-trading | | 88,958 | — | — | 88,958 |
| Items in course of transmission to other banks | | 5,977 | — | — | 5,977 |
| Trading liabilities | | 153,691 | 643 | 1 | 154,335 |
| Financial liabilities designated at fair value | | 86,832 | (6,012 |)— | 80,820 |
| – of which: | | | | | |
| included in tier 1 | m | 411 | — | — | 411 |
| included in tier 2 | n, q | 23,172 | — | — | 23,172 |
| Derivatives | | 279,819 | 193 | 64 | 280,076 |
| Debt securities in issue | | 65,915 | (3,547 |)662 | 63,030 |
| Accruals, deferred income and other liabilities | | 44,291 | 1,810 | 495 | 46,596 |
| Current tax liabilities | | 719 | (26 |)— | 693 |
| Liabilities under insurance contracts | | 75,273 | (75,273 |)— | — |
| Provisions | | 4,773 | (18 |)— | 4,755 |
| – of which: credit-related contingent liabilities and contractual commitments on IRB portfolios | h | 267 | — | — | 267 |
| Deferred tax liabilities | | 1,623 | (981 |)1 | 643 |
| Subordinated liabilities | | 20,984 | 1 | — | 20,985 |
| – of which: | | | | | |
| included in tier 1 | k, m | 1,754 | — | — | 1,754 |
| included in tier 2 | n, o, q | 18,652 | — | — | 18,652 |
| Total liabilities at 31 Dec 2016 | | 2,192,408 | (83,304 |)16,661 | 2,125,765 |
| Equity | | | | | |
| Called up share capital | a | 10,096 | — | — | 10,096 |
| Share premium account | a, k | 12,619 | — | — | 12,619 |
| Other equity instruments | j, k | 17,110 | — | — | 17,110 |
| Other reserves | c, g | (1,234 |)1,735 | — | 501 |
| Retained earnings | b, c | 136,795 | (9,442 |)— | 127,353 |
| Total shareholders' equity | | 175,386 | (7,707 |)— | 167,679 |
| Non-controlling interests | d, l, m, p | 7,192 | (1,004 |)— | 6,188 |
| – of which: non-cumulative preference shares issued by subsidiaries | m | 260 | — | — | 260 |
| included in tier 1 capital | | | | | |
| Total equity at 31 Dec 2016 | | 182,578 | (8,711 |)— | 173,867 |
| Total liabilities and equity at 31 Dec 2016 | | 2,374,986 | (92,015 |)16,661 | 2,299,632 |

† The references (a) – (q) identify balance sheet components that are used in the calculation of regulatory capital on page 14.

Pillar 3 Disclosures at 31 December 2017

Table 3: Principal entities with a different regulatory and accounting scope of consolidation

| | Principal activities | Method of accounting consolidation | Method of regulatory consolidation | At 31 Dec 2017 | | At 31 Dec 2016 | |
|---|------------------------------|------------------------------------|------------------------------------|----------------|--------------|----------------|--------------|
| | | | | Total assets | Total equity | Total assets | Total equity |
| | | | | Footnote \$m | \$m | \$m | \$m |
| Principal associates | | | | | | | |
| The Saudi British Bank | Banking services | Equity | Proportional consolidation | 50,417 | 8,752 | 49,784 | 8,202 |
| Principal insurance entities excluded from the regulatory consolidation | | | | | | | |
| HSBC Life (International) Ltd | Life insurance manufacturing | Fully consolidated | N/A | 45,083 | 3,679 | 39,346 | 2,838 |
| HSBC Assurances Vie (France) | Life insurance manufacturing | Fully consolidated | N/A | 27,713 | 843 | 23,418 | 721 |
| Hang Seng Insurance Company Ltd | Life insurance manufacturing | Fully consolidated | N/A | 16,411 | 1,403 | 15,225 | 1,107 |
| HSBC Insurance (Singapore) Pte Ltd | Life insurance manufacturing | Fully consolidated | N/A | 4,425 | 706 | 3,589 | 360 |
| HSBC Life (UK) Ltd | Life insurance manufacturing | Fully consolidated | N/A | 2,115 | 196 | 1,678 | 158 |
| HSBC Life Assurance (Malta) Ltd | Life insurance manufacturing | Fully consolidated | N/A | 1,681 | 61 | 1,747 | 54 |
| HSBC Life Insurance Company Ltd | Life insurance manufacturing | Fully consolidated | N/A | 1,113 | 87 | 864 | 85 |
| HSBC Seguros S.A. (Mexico) | Life insurance manufacturing | Fully consolidated | N/A | 785 | 120 | 716 | 118 |
| Principal SPEs excluded from the regulatory consolidation | | | | | | | |
| | | | | 1 | | | |
| Regency Assets Ltd | Securitisation | Fully consolidated | N/A | 7,466 | — | 7,380 | — |
| Mazarin Funding Ltd | Securitisation | Fully consolidated | N/A | 852 | 48 | 1,117 | 12 |
| Barion Funding Ltd | Securitisation | Fully consolidated | N/A | 424 | 78 | 653 | 56 |
| Metrix Portfolio Distribution Plc | Securitisation | Fully consolidated | N/A | 326 | — | 333 | — |

1 These SPEs issued no or de minimis share capital.

Table 3 also presents the total assets and total equity, on a stand-alone IFRS basis, of the entities which are included in the Group consolidation on different bases for accounting and regulatory purposes. The figures shown therefore include intra-Group balances. For associates, table 3 shows the total assets and total equity of the entity as a whole rather than HSBC's share in the entities' balance sheets.

For insurance entities, the present value of the in-force long-term insurance business asset of \$6.6bn and the related deferred tax liability are only recognised on consolidation in financial reporting, and are therefore not included in the asset or equity positions for the stand-alone entities presented in table 3. In addition, these figures exclude any deferred acquisition cost assets that may be recognised in the entities' stand-alone financial reporting.

Measurement of regulatory exposures

This section sets out the main reasons why the measurement of regulatory exposures is not directly comparable with the financial information presented in the Annual Report and Accounts 2017.

The Pillar 3 Disclosures at December 2017 are prepared in accordance with regulatory capital adequacy concepts and rules, while the Annual Report and Accounts 2017 are prepared in accordance with IFRSs. The purpose of the regulatory balance sheet is to provide a point-in-time ('PIT') value of all on-balance sheet assets.

The regulatory exposure value includes an estimation of risk, and is expressed as the amount expected to be outstanding if and when the counterparty defaults.

Moreover, regulatory exposure classes are based on different criteria from accounting asset types and are therefore not comparable on a line by line basis.

The following tables show in two steps how the accounting values in the regulatory balance sheet link to regulatory exposure at default ('EAD').

In a first step, table 4 shows the difference between the accounting and regulatory scope of consolidation, and a breakdown of the accounting balances into the risk types that form the basis for regulatory capital requirements. Table 5 then shows the main differences between the accounting balances and regulatory exposures by regulatory risk type.

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

| | Carrying value of items | | | | | | |
|--|---|--|--------------------------------------|---|--|--------------------------------------|---|
| | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation ¹ | Subject to the credit risk framework | Subject to the counter-party credit risk framework ² | Subject to the securitisation framework ³ | Subject to the market risk framework | Subject to deduction from capital or not subject to regulatory capital requirements |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Assets | | | | | | | |
| Cash and balances at central banks | 180.6 | 181.8 | 164.7 | — | — | — | — |
| Items in the course of collection from other banks | 6.6 | 6.6 | 6.6 | — | — | — | — |
| Hong Kong Government certificates of indebtedness | 34.2 | 34.2 | 34.2 | — | — | — | — |
| Trading assets | 288.0 | 287.6 | 2.0 | 17.1 | — | 270.4 | 15.2 |
| Financial assets designated at fair value | 29.5 | 0.8 | 0.8 | — | — | — | — |
| Derivatives | 219.8 | 219.7 | — | 218.5 | 1.2 | 219.7 | — |
| Loans and advances to banks | 90.4 | 89.8 | 98.6 | 6.6 | 0.6 | — | 1.1 |
| Loans and advances to customers | 963.0 | 972.2 | 943.7 | 10.4 | 13.1 | — | 5.0 |
| Reverse repurchase agreements – non-trading | 201.6 | 203.4 | — | 203.4 | — | — | — |
| Financial investments | 389.1 | 330.9 | 324.1 | — | 6.5 | — | 0.3 |
| Capital invested in insurance and other entities | — | 2.4 | 1.6 | — | — | — | 0.8 |
| Current tax assets | 1.0 | 1.0 | 1.0 | — | — | — | — |
| | 67.1 | 63.4 | 42.0 | 3.8 | 0.1 | 13.3 | 6.0 |

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| | | | | | | | |
|---|---------|---------|---------|-------|------|-------|---------|
| Prepayments, accrued income and other assets | | | | | | | |
| Interests in associates and joint ventures | 22.7 | 18.3 | 12.9 | — | — | — | 5.4 |
| Goodwill and intangible assets | 23.5 | 16.5 | — | — | — | — | 16.4 |
| Deferred tax assets | 4.7 | 4.8 | 6.3 | — | — | — | (1.5) |
| Total assets at 31 Dec 2017 | 2,521.8 | 2,433.4 | 1,638.5 | 459.8 | 21.5 | 503.4 | 48.7 |
| Liabilities | | | | | | | |
| Hong Kong currency notes in circulation | 34.2 | 34.2 | — | — | — | — | 34.2 |
| Deposits by banks | 69.9 | 70.5 | — | — | — | — | 70.5 |
| Customer accounts | 1,364.5 | 1,379.4 | — | — | — | — | 1,379.4 |
| Repurchase agreements – non trading | 130.0 | 130.0 | — | 130.0 | — | — | — |
| Items in course of transmission to other banks | 6.9 | 6.9 | — | — | — | — | 6.9 |
| Trading liabilities | 184.4 | 185.2 | — | 10.6 | — | 172.2 | 13.0 |
| Financial liabilities designated at FV | 94.4 | 88.8 | — | — | — | — | 88.8 |
| Derivatives | 216.8 | 216.9 | — | 216.9 | — | 216.9 | — |
| Debt securities in issue | 64.5 | 61.9 | — | — | — | — | 61.9 |
| Current tax liabilities | 0.9 | 0.8 | — | — | — | — | 0.8 |
| Liabilities under insurance contract | 85.7 | — | — | — | — | — | — |
| Accruals, deferred income, and other liabilities | 45.9 | 46.3 | — | — | — | — | 46.3 |
| Provisions | 4.0 | 4.2 | 0.3 | — | — | — | 3.9 |
| | 2.0 | 0.9 | 1.3 | — | — | — | 1.7 |

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| | | | | | | | |
|----------------------------------|----------|---------|-----|-------|---|-------|---------|
| Deferred tax liabilities | | | | | | | |
| Subordinated liabilities | 19.8 | 19.9 | — | — | — | — | 19.9 |
| Total liabilities at 31 Dec 2017 | 12,323.9 | 2,245.9 | 1.6 | 357.5 | — | 389.1 | 1,727.3 |

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Pillar 3 Disclosures at 31 December 2017

Table 4: Differences between accounting and regulatory scopes of consolidation and mapping of financial statement categories with regulatory risk categories (continued)

| | Carrying value of items | | | | | | |
|--|---|--|--------------------------------------|---|--|--------------------------------------|---|
| | Carrying values as reported in published financial statements | Carrying values under scope of regulatory consolidation ¹ | Subject to the credit risk framework | Subject to the counter-party credit risk framework ² | Subject to the securitisation framework ³ | Subject to the market risk framework | Subject to deduction from capital or not subject to regulatory capital requirements |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Assets | | | | | | | |
| Cash and balances at central banks | 128.0 | 129.2 | 129.2 | — | — | — | — |
| Items in the course of collection from other banks | 5.0 | 5.0 | 5.0 | — | — | — | — |
| Hong Kong Government certificates of indebtedness | 31.2 | 31.2 | 31.2 | — | — | — | — |
| Trading assets | 235.1 | 234.9 | 8.4 | 11.3 | — | 208.7 | 17.6 |
| Financial assets designated at fair value | 24.8 | 0.3 | 0.3 | — | — | — | — |
| Derivatives | 290.9 | 290.8 | — | 289.9 | 0.9 | 290.8 | — |
| Loans and advances to banks | 88.1 | 87.2 | 76.3 | 2.0 | 1.2 | — | 7.7 |
| Loans and advances to customers | 861.5 | 871.1 | 847.4 | 8.9 | 10.8 | — | 4.0 |
| Reverse repurchase agreements – non-trading | 161.0 | 162.8 | — | 162.4 | 0.4 | — | — |
| Financial investments | 436.8 | 385.4 | 375.8 | — | 9.5 | — | 0.1 |
| Capital invested in insurance and other entities | — | 2.2 | 1.4 | — | — | — | 0.8 |
| | 1.1 | 1.0 | 1.0 | — | — | — | — |

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| | | | | | | | |
|--|---------|---------|---------|-------|------|-------|---------|
| Current tax assets | | | | | | | |
| Prepayments, accrued income and other assets | 63.9 | 61.2 | 42.4 | 3.9 | — | 8.2 | 6.7 |
| Interests in associates and joint ventures | 20.0 | 15.8 | 10.3 | — | — | — | 5.5 |
| Goodwill and intangible assets | 21.3 | 15.2 | — | — | — | — | 15.2 |
| Deferred tax assets | 6.2 | 6.3 | 5.2 | — | — | — | 1.1 |
| Total assets at 31 Dec 2016 | 2,374.9 | 2,299.6 | 1,533.9 | 478.4 | 22.8 | 507.7 | 58.7 |
| Liabilities | | | | | | | |
| Hong Kong currency notes in circulation | 31.2 | 31.2 | — | — | — | — | 31.2 |
| Deposits by banks | 59.9 | 60.3 | — | — | — | — | 60.3 |
| Customer accounts | 1,272.4 | 1,287.3 | — | — | — | — | 1,287.3 |
| Repurchase agreements – non trading | 89.0 | 89.0 | — | 89.0 | — | — | — |
| Items in course of transmission to other banks | 6.0 | 6.0 | — | — | — | — | 6.0 |
| Trading liabilities | 153.7 | 154.3 | — | 5.1 | — | 139.1 | 15.2 |
| Financial liabilities designated at FV | 86.8 | 80.8 | — | — | — | — | 80.8 |
| Derivatives | 279.8 | 280.1 | — | 280.1 | — | 280.1 | — |
| Debt securities in issue | 65.9 | 63.0 | — | — | — | — | 63.0 |
| Current tax liabilities | 0.7 | 0.7 | — | — | — | — | 0.7 |
| Liabilities under insurance contract | 75.3 | 0.0 | — | — | — | — | — |
| Accruals, deferred income, and other liabilities | 44.3 | 46.7 | — | — | — | — | 46.7 |

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| | | | | | | | |
|----------------------------------|---------|---------|-----|-------|---|-------|---------|
| Provisions | 4.8 | 4.8 | 0.3 | — | — | — | 4.5 |
| Deferred tax liabilities | 1.6 | 0.6 | 0.6 | — | — | — | — |
| Subordinated liabilities | 21.0 | 21.0 | — | — | — | — | 21.0 |
| Total liabilities at 31 Dec 2016 | 2,192.4 | 2,125.8 | 0.9 | 374.2 | — | 419.2 | 1,616.7 |

1 The amounts shown in the column ‘Carrying values under scope of regulatory consolidation’ do not equal the sum of the amounts shown in the remaining columns of this table for line items ‘Derivatives’ and ‘Trading assets’, as some of the assets included in these items are subject to regulatory capital charges for both CCR and market risk.

2 The amounts shown in the column ‘Subject to the counterparty credit risk framework’ include both non-trading book and trading book.

3 The amounts shown in the column ‘Subject to the securitisation framework’ only include non-trading book. Trading book securitisation positions are included in the market risk column.

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

| | Total \$bn | Items subject to: | | |
|---|---------------|----------------------------------|--------------------------|-------------------------------------|
| | | Credit risk framework \$bn | CCR framework \$bn | Securitisation framework \$bn |
| Carrying value of assets within scope of regulatory consolidation ¹ | 2,384.7 | 1,638.5 | 459.8 | 21.5 |
| Carrying value of liabilities within scope of regulatory consolidation ¹ | 520.7 | 1.6 | 357.5 | — |
| Net carrying value within scope of regulatory consolidation | 1,864.0 | 1,636.9 | 102.3 | 21.5 |
| Off-balance sheet amounts and potential future exposure for counterparty risk | 801.7 | 271.0 | 135.2 | 15.3 |
| Differences in netting rules | 10.4 | 9.3 | 1.1 | |
| Differences due to financial collateral on standardised approach | (14.7) | (14.7) | | |
| Differences due to impairments on IRB approach | 4.7 | 4.7 | | |
| Differences due to EAD modelling and other differences | 3.3 | 5.0 | | (1.7) |
| Differences due to credit risk mitigation | (71.1) | | (71.1) | |
| Exposure values considered for regulatory purposes at 31 Dec 2017 | 2,598.3 | 1,912.2 | 167.5 | 35.1 |

¹ Excludes amounts subject to deduction from capital or not subject to regulatory capital requirements.

Explanations of differences between accounting and regulatory exposure amounts

Off-balance sheet amounts and potential future exposure for counterparty risk (CCR)

Off-balance sheet amounts subject to credit risk and securitisation regulatory frameworks include undrawn portions of committed facilities, various trade finance commitments and guarantees, by applying a credit conversion factor ('CCF') to these items and consideration of potential future exposures ('PFE') for counterparty risk.

Differences in netting rules

Under IFRS, netting is only permitted if legal right of set-off exists and the cash flows are intended to be settled on a net basis. Under the PRA's regulatory rules, however, netting is applied for capital calculations if there is legal certainty and the positions are managed on a net collateralised basis. As a consequence, we recognise greater netting under the PRA's rules, reflecting the close-out provisions that would take effect in the event of default of a counterparty rather than just those transactions that are actually settled net in the normal course of business.

Differences due to financial collateral

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

Differences due to impairments

The carrying value of assets is net of credit risk adjustments. The regulatory exposure value under IRB approaches is before deducting credit risk adjustments.

Differences due to EAD modelling

The carrying value of assets is usually measured at amortised cost or fair value as at the balance sheet date. For certain IRB models, the exposure value used as EAD is the projected value one year hence.

Differences due to credit risk adjustments

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

Explanation 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 that differs both in terms of scope and measurement from HSBC'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 spreads ('CVA') and investing and funding costs ('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.

Pillar 3 Disclosures at 31 December 2017

Capital and RWAs

Capital management

Approach and policy

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

Our capital management process culminates in the annual Group capital plan, which is approved by the Board. HSBC Holdings is the primary provider of equity capital to its subsidiaries and also provides them with non-equity capital where necessary. These investments are substantially funded by HSBC Holdings' issuance of equity and non-equity capital and by profit retention. As part of its capital management process, HSBC Holdings seeks to maintain a balance between the composition of its capital and its investment in subsidiaries. Subject to the above, there is no current or foreseen impediment to HSBC Holdings' ability to provide such investments.

Each subsidiary manages its own capital to support its planned business growth and meet its local regulatory requirements within the context of the Group capital plan. Capital generated by subsidiaries in excess of planned requirements is returned to HSBC Holdings, normally by way of dividends, in accordance with the Group's capital plan.

During 2017, consistent with the Group's capital plan, the Group's subsidiaries did not experience any significant restrictions on

paying dividends or repaying loans and advances, and none are envisaged with regard to planned dividends or payments. However, the ability of subsidiaries to pay dividends or advance monies to HSBC Holdings depends on, among other things, their respective local regulatory capital and banking requirements, exchange controls, statutory reserves, and financial and operating performance. None of our subsidiaries that are excluded from the regulatory consolidation have capital resources below their minimum regulatory requirement. HSBC Holdings has not entered into any Group Financial Support Agreements pursuant to the application of early intervention measures under the Bank Recovery and Resolution Directive.

All capital securities included in the capital base of HSBC have either been issued as fully compliant CRD IV securities (on an end point basis) or in accordance with the rules and guidance in the PRA's previous General Prudential Sourcebook, which are included in the capital base by virtue of application of the CRD IV grandfathering provisions. The main features of capital securities issued by the Group, categorised as tier 1 ('T1') capital and tier 2 ('T2') capital, are set out on the HSBC website, www.hsbc.com.

The values disclosed are the IFRS balance sheet carrying amounts, not the amounts that these securities contribute to regulatory capital. For example, the IFRS accounting and the regulatory treatments differ in their approaches to issuance costs, regulatory amortisation and regulatory eligibility limits prescribed in the grandfathering provisions under CRD IV.

A list of the features of our capital instruments in accordance with Annex III of Commission Implementing Regulation 1423/2013 is also published on our website with reference to our balance sheet on 31 December 2017. This is in addition to the full terms and conditions of our securities, also available on our website.

For further details of our approach to capital management, please see page 162 of the Annual Report and Accounts 2017.

Own funds

Table 6: Own funds disclosure

| Ref ^{ns*} | Ref [†] | At | CRD IV | Final |
|--------------------|------------------|-----------------------|----------------------------------|----------------|
| | | 31 Dec 2017 | prescribed residual amount | CRD IV text |
| | | \$m | \$m | \$m |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 1 | | 18,932 | | 18,932 |
| | a | 18,932 | | 18,932 |
| 2 | b | 124,679 | | 124,679 |
| 3 | c | 9,433 | | 9,433 |
| 5 | d | 4,905 | | 4,905 |
| 5a | b | 608 | | 608 |
| 6 | | 158,557 | | 158,557 |
| | | | | |
| 7 | | (1,146) | | (1,146) |
| 8 | e | (16,872) | | (16,872) |
| 10 | f | (1,181) | | (1,181) |
| 11 | g | 208 | | 208 |
| 12 | h | (2,820) | | (2,820) |
| 14 | | 3,731 | | 3,731 |
| 15 | i | (6,740) | | (6,740) |
| 16 | | (40) | | (40) |
| 19 | | (7,553) | | (7,553) |
| 28 | | (32,413)— | | (32,413) |
| 29 | | 126,144 — | | 126,144 |
| | | | | |
| 30 | | 16,399 — | | 16,399 |
| 31 | j | 16,399 — | | 16,399 |
| 33 | k | 6,622 (6,622)— | | |
| 34 | l, m | 1,901 (1,709)192 | | |
| 35 | m | 1,374 (1,374)— | | |
| 36 | | 24,922 (8,331)16,591 | | |
| 37 | | (60) (60) | | |
| 41b | | (52)52 — | | |
| | | (52)52 — | | |

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– direct and indirect holdings by the institution of the T2 instruments and subordinated loans of financial sector entities where the institution has a significant investment in those entities

| | | | | | | |
|----|--|------|---------|-----------|--|---------|
| 43 | Total regulatory adjustments to additional tier 1 capital | | (112) | 52 | | (60) |
| 44 | Additional tier 1 capital | | 24,810 | (8,279) | | 16,531 |
| 45 | Tier 1 capital (T1 = CET1 + AT1) | | 150,954 | (8,279) | | 142,675 |
| | Tier 2 capital: instruments and provisions | | | | | |
| 46 | Capital instruments and the related share premium accounts | n | 16,880 | | | 16,880 |
| | Amount of qualifying items and the related share premium accounts subject to | | | | | |
| 47 | phase out from T2 | o | 4,746 | (4,746) | | — |
| | Qualifying own funds instruments included in consolidated T2 capital | | | | | |
| 48 | (including minority interests and AT1 instruments not included in CET1 or AT1) issued by subsidiaries and held by third parties | p, q | 10,306 | (10,218) | | 88 |
| 49 | – of which: instruments issued by subsidiaries subject to phase out | q | 10,236 | (10,236) | | — |
| 51 | Tier 2 capital before regulatory adjustments | | 31,932 | (14,964) | | 16,968 |
| | Tier 2 capital: regulatory adjustments | | | | | |
| 52 | Direct and indirect holdings of own T2 instruments | | (40) | | | (40) |
| | Direct and indirect holdings by the institution of the T2 instruments and | | | | | |
| 55 | subordinated loans of financial sector entities where the institution has a significant investment in those entities (net of eligible short positions) | | (463) | (52) | | (515) |
| 57 | Total regulatory adjustments to tier 2 capital | | (503) | (52) | | (555) |
| 58 | Tier 2 capital | | 31,429 | (15,016) | | 16,413 |
| 59 | Total capital (TC = T1 + T2) | | 182,383 | (23,295) | | 159,088 |

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Pillar 3 Disclosures at 31 December 2017

Table 6: Own funds disclosure (continued)

| Ref** | At 31 Dec 2017 | CRD IV prescribed residual amount | Final CRD IV text |
|--|----------------|-----------------------------------|-------------------|
| Ref† | \$m | \$m | \$m |
| 60 | 871,337 | — | 871,337 |
| Capital ratios and buffers | | | |
| 61 | 14.5% | | 14.5% |
| 62 | 17.3% | | 16.4% |
| 63 | 20.9% | | 18.3% |
| 64 | 2.72% | | |
| 65 | 1.25% | | |
| 66 | 0.22% | | |
| 67a | 1.25% | | |
| 68 | 8.0% | | |
| Amounts below the threshold for deduction (before risk weighting) | | | |
| 72 | 4,473 | | |
| Direct and indirect holdings of the capital of financial sector entities where the institution does not have a significant investment in those entities (amount below 10% threshold and net of eligible short positions) | | | |
| 73 | 13,370 | | |
| Direct and indirect holdings by the institution of the CET1 instruments of financial sector entities where the institution has a significant investment in those entities (amount below 10% threshold and net of eligible short positions) | | | |
| 75 | 5,004 | | |
| Deferred tax assets arising from temporary differences (amount below 10% threshold, net of related tax liability) | | | |
| Applicable caps on the inclusion of provisions in tier 2 | | | |
| 77 | 2,193 | | |
| Cap on inclusion of credit risk adjustments in T2 under standardised approach | | | |
| 79 | 3,150 | | |
| Cap for inclusion of credit risk adjustments in T2 under internal ratings-based approach | | | |
| Capital instruments subject to phase-out arrangements (only applicable between 1 Jan 2013 and 1 Jan 2022) | | | |
| 82 | 8,652 | | |
| Current cap on AT1 instruments subject to phase out arrangements | | | |
| 83 | 1,526 | | |
| Amount excluded from AT1 due to cap (excess over cap after redemptions and maturities) | | | |
| 84 | 14,982 | | |
| Current cap on T2 instruments subject to phase out arrangements | | | |
| 85 | 5,290 | | |
| Amount excluded from T2 due to cap (excess over cap after redemptions and maturities) | | | |

* The references identify the lines prescribed in the European Banking Authority ('EBA') template. Lines represented in this table are those lines which are applicable and where there is a value.

† The references (a) – (q) identify balance sheet components on page 6 which are used in the calculation of regulatory capital.

CET1 capital increased during the year by \$9.5bn, due to:

\$3.7bn of capital generated through profits, net of dividends and scrip;

\$6.3bn of favourable foreign currency translation differences;

regulatory netting of \$1.5bn;

a decrease of \$1.3bn in the deduction for excess expected loss; and

an increase of \$1.0bn in the value of minority interests allowed in CET1.

These increases were partly offset by:

the \$3.0bn share buy-back; and

a \$1.2bn decrease as a result of the change in US tax legislation; this change also reduces RWAs by \$3.1bn.

Leverage ratio

Our leverage ratio calculated in accordance with CRD IV was 5.6% at 31 December 2017, up from 5.4% at 31 December 2016. Growth in tier 1 capital was partly offset by a rise in exposure, primarily due to growth in customer advances, balances at central banks and trading assets.

In October 2017, the PRA increased the minimum requirement of the UK leverage ratio from 3% to 3.25%.

At 31 December 2017, our UK minimum leverage ratio requirement of 3.25% was supplemented by an additional leverage ratio buffer of 0.4% and a countercyclical leverage ratio buffer of 0.1%.

These additional buffers translate into capital values of \$10.3bn and \$1.8bn respectively. We comfortably exceeded these leverage requirements.

The risk of excessive leverage is managed as part of HSBC's global risk appetite framework and monitored using a leverage ratio metric within our risk appetite statement ('RAS'). The RAS articulates the aggregate level and types of risk that HSBC is willing to accept in its business activities in order to achieve its strategic business objectives. The RAS is monitored via the risk appetite profile report, which includes comparisons of actual performance against the risk appetite and tolerance thresholds assigned to each metric, to ensure that any excessive risk is highlighted, assessed and mitigated appropriately. The risk appetite profile report is presented monthly to the RMM and the GRC. Our approach to risk appetite is described on page 95 of the Annual Report and Accounts 2017.

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Table 7: Summary reconciliation of accounting assets and leverage ratio exposures

| Ref* | | At 31 Dec | |
|------|---|-----------|---------|
| | | 2017 | 2016 |
| | | \$bn | \$bn |
| 1 | Total assets as per published financial statements | 2,521.8 | 2,375.0 |
| | Adjustments for: | | |
| 2 | – entities which are consolidated for accounting purposes but are outside the scope of regulatory consolidation | (88.4) | (75.4) |
| 4 | – derivative financial instruments | (91.0) | (158.6) |
| 5 | – securities financing transactions ('SFT') | 12.2 | 10.1 |
| 6 | – off-balance sheet items (i.e. conversion to credit equivalent amounts of off-balance sheet exposures) | 227.4 | 223.1 |
| 7 | – other | (24.9) | (19.8) |
| 8 | Total leverage ratio exposure | 2,557.1 | 2,354.4 |

* The references identify the lines prescribed in the EBA template. Lines represented in this table are those lines which are applicable and where there is a value.

Table 8: Leverage ratio common disclosure

| Ref* | | At 31 Dec | |
|------|---|-----------|---------|
| | | 2017 | 2016 |
| | | \$bn | \$bn |
| | On-balance sheet exposures (excluding derivatives and SFT) | | |
| 1 | On-balance sheet items (excluding derivatives, SFTs and fiduciary assets, but including collateral) | 1,998.7 | 1,844.4 |
| 2 | (Asset amounts deducted in determining tier 1 capital) | (35.3) | (34.4) |
| 3 | Total on-balance sheet exposures (excluding derivatives, SFTs and fiduciary assets) | 1,963.4 | 1,810.0 |
| | Derivative exposures | | |
| 4 | Replacement cost associated with all derivatives transactions (i.e. net of eligible cash variation margin) | 29.0 | 43.7 |
| 5 | Add-on amounts for potential future exposure ('PFE') associated with all derivatives transactions (mark-to-market method) | 125.5 | 110.2 |
| 6 | Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to IFRSs | 5.2 | 5.9 |
| 7 | (Deductions of receivables assets for cash variation margin provided in derivatives transactions) | (23.6) | (30.6) |
| 8 | (Exempted central counterparty ('CCP') leg of client-cleared trade exposures) | (14.0) | (4.1) |
| 9 | Adjusted effective notional amount of written credit derivatives | 188.2 | 216.4 |
| 10 | (Adjusted effective notional offsets and add-on deductions for written credit derivatives) | (181.6) | (209.3) |
| 11 | Total derivative exposures | 128.7 | 132.2 |
| | Securities financing transaction exposures | | |
| 12 | Gross SFT assets (with no recognition of netting), after adjusting for sales accounting transactions | 331.2 | 266.6 |
| 13 | (Netted amounts of cash payables and cash receivables of gross SFT assets) | (105.8) | (87.9) |
| 14 | Counterparty credit risk exposure for SFT assets | 12.2 | 10.4 |
| 16 | Total securities financing transaction exposures | 237.6 | 189.1 |
| | Other off-balance sheet exposures | | |
| 17 | Off-balance sheet exposures at gross notional amount | 801.7 | 757.7 |
| 18 | (Adjustments for conversion to credit equivalent amounts) | (574.3) | (534.6) |
| 19 | Total off-balance sheet exposures | 227.4 | 223.1 |

| Capital and total exposures | | | |
|-----------------------------|---|-----------------|-----------------|
| 20 | Tier 1 capital | 142.7 | 127.3 |
| 21 | Total leverage ratio exposure | 2,557.1 | 2,354.4 |
| 22 | Leverage ratio (%) | 5.6 | 5.4 |
| EU-23 | Choice of transitional arrangements for the definition of the capital measure | Fully phased-in | Fully phased-in |

* The references identify the lines prescribed in the EBA template. Lines represented in this table are those lines which are applicable and where there is a value.

Table 9: Leverage ratio – Split of on-balance sheet exposures (excluding derivatives, SFTs and exempted exposures)

| Ref* | | At 31 Dec | |
|-------|---|-----------|---------|
| | | 2017 | 2016 |
| | | \$bn | \$bn |
| EU-1 | Total on-balance sheet exposures (excluding derivatives, SFTs, and exempted exposures) | 1,998.7 | 1,844.4 |
| EU-2 | – trading book exposures | 268.6 | 267.5 |
| EU-3 | – banking book exposures | 1,730.1 | 1,576.9 |
| | 'banking book exposures' comprises: | | |
| EU-4 | covered bonds | 1.3 | 1.1 |
| EU-5 | exposures treated as sovereigns | 504.8 | 504.4 |
| EU-6 | exposures to regional governments, multilateral development banks ('MDB'), international organisations and public sector entities not treated as sovereigns | 9.8 | 6.0 |
| EU-7 | institutions | 77.0 | 67.6 |
| EU-8 | secured by mortgages of immovable properties | 283.4 | 254.6 |
| EU-9 | retail exposures | 89.3 | 84.6 |
| EU-10 | corporate | 586.0 | 532.4 |
| EU-11 | exposures in default | 9.7 | 12.4 |
| EU-12 | other exposures (e.g. equity, securitisations and other non-credit obligation assets) | 168.8 | 113.8 |

* The references identify the lines prescribed in the EBA template. Lines represented in this table are those lines which are applicable and where there is a value.

Pillar 3 Disclosures at 31 December 2017

Capital buffers

Our geographical breakdown and institution specific countercyclical capital buffer ('CCyB') disclosure and our G-SIB Indicator disclosure are published annually on the HSBC website, www.hsbc.com.

Pillar 1 minimum capital requirements and RWA flow

Pillar 1 covers the minimum capital resource requirements for credit risk, counterparty credit risk ('CCR'), equity, securitisation, market risk and operational risk. These requirements are expressed in terms of RWAs.

| Risk category | Scope of permissible approaches | Approach adopted by HSBC |
|---------------|--|---|
| Credit risk | <p>The Basel Committee's framework applies three approaches of increasing sophistication to the calculation of Pillar 1 credit risk capital requirements. The most basic level, the standardised approach, requires banks to use external credit ratings to determine the risk weightings applied to rated counterparties. Other counterparties are grouped into broad categories and standardised risk weightings are applied to these categories. The next level, the foundation IRB ('FIRB') approach, allows banks to calculate their credit risk capital requirements on the basis of their internal assessment of a counterparty's probability of default ('PD'), but subjects their quantified estimates of EAD and loss given in default ('LGD') to standard supervisory parameters. Finally, the advanced IRB ('AIRB') approach allows banks to use their own internal assessment in determining PD and in quantifying EAD and LGD.</p> | <p>For consolidated Group reporting, we have adopted the advanced IRB approach for the majority of our business. Some portfolios remain on the standardised or foundation IRB approaches:</p> <ul style="list-style-type: none"> • pending the issuance of local regulations or model approval; • following supervisory prescription of a non-advanced approach; or • under exemptions from IRB treatment. |

| | | |
|--------------------------|---|---|
| Counterparty credit risk | <p>Four approaches to calculating CCR and determining exposure values are defined by the Basel Committee: mark-to-market, original exposure, standardised and Internal Model Method ('IMM'). These exposure values are used to determine capital requirements under one of the three approaches to credit risk: standardised, foundation IRB or advanced IRB.</p> | <p>We use the mark-to-market and IMM approaches for CCR. Details of the IMM permission we have received from the PRA can be found in the Financial Services Register on the PRA website. Our aim is to increase the proportion of positions on IMM over time.</p> |
| Equity | <p>For the non-trading book, equity exposures can be assessed under standardised or IRB approaches.</p> | <p>For Group reporting purposes, all non-trading book equity exposures are treated under the standardised approach.</p> |
| Securitisation | <p>Basel specifies two approaches for calculating credit risk requirements for securitisation positions in non-trading books: the standardised approach and the IRB approach, which incorporates the Ratings Based Method ('RBM'), the Internal Assessment Approach ('IAA') and the Supervisory Formula Method ('SFM'). Securitisation positions in the trading book are treated within the market risk framework, using the CRD IV standard rules.</p> | <p>For the majority of non-trading book securitisation positions we use the IRB approach and, within this, principally the RBM with lesser amounts on the IAA and</p> |

| | | |
|-------------|--|--|
| | | the SFM. We also use the standardised approach for an immaterial amount of non-trading book positions. We follow the CRD IV standard rules for securitisation positions in the trading book. |
| Market risk | Market risk capital requirements can be determined under either the standard rules or the Internal Models Approach ('IMA'). The latter involves the use of internal value at risk ('VaR') models to measure market risks and determine the appropriate capital requirements. In addition to the VaR models, other internal models include stressed VaR ('SVaR'), Incremental Risk Charge ('IRC') and Comprehensive Risk Measure. | The market risk capital requirement is measured using internal market risk models, where approved by the PRA, or under the standard rules. Our internal market risk models comprise VaR, stressed VaR and IRC. Non-proprietary details of the scope of our IMA permission are available in the Financial Services Register on the PRA website. We are in compliance with the |

| | | |
|------------------|--|---|
| Operational risk | The Basel Committee allows firms to calculate their operational risk capital requirement under the basic indicator approach, the standardised approach or the advanced measurement approach. | requirements set out in Articles 104 and 105 of the Capital Requirements Regulation. We currently use the standardised approach in determining our operational risk capital requirement. We have in place an operational risk model that is used for economic capital calculation purposes. |
|------------------|--|---|

Table 10: Overview of RWAs

| | At | | |
|--|-------------|-------------|-------------------------------|
| | 31 Dec 2017 | 30 Sep 2017 | 31 Dec 2017 |
| | RWAs | RWAs | Capital ¹ required |
| | \$bn | \$bn | \$bn |
| 1 Credit risk (excluding counterparty credit risk) | 623.9 | 615.9 | 50.0 |
| 2 – standardised approach | 126.9 | 129.8 | 10.2 |
| 3 – foundation IRB approach | 28.4 | 27.7 | 2.3 |
| 4 – advanced IRB approach | 468.6 | 458.4 | 37.5 |
| 6 Counterparty credit risk | 54.1 | 59.8 | 4.4 |
| 7 – mark-to-market | 34.2 | 37.2 | 2.7 |
| 10– internal model method | 9.7 | 10.0 | 0.8 |
| 11– risk exposure amount for contributions to the default fund of a central counterparty | 0.7 | 0.7 | 0.1 |
| 12– credit valuation adjustment | 9.5 | 11.9 | 0.8 |
| 13 Settlement risk | 0.4 | 0.7 | — |
| 14 Securitisation exposures in the non-trading book | 15.3 | 22.8 | 1.2 |
| 15– IRB ratings based method | 12.0 | 20.0 | 1.0 |
| 16– IRB supervisory formula method | 0.2 | 0.2 | — |
| 17– IRB internal assessment approach | 1.5 | 1.5 | 0.1 |
| 18– standardised approach | 1.6 | 1.1 | 0.1 |
| 19 Market risk | 38.9 | 42.6 | 3.1 |
| 20– standardised approach | 4.4 | 4.4 | 0.3 |
| 21– internal models approach | 34.5 | 38.2 | 2.8 |
| 23 Operational risk | 92.7 | 98.0 | 7.4 |
| 25– standardised approach | 92.7 | 98.0 | 7.4 |
| 27 Amounts below the thresholds for deduction (subject to 250% risk weight) | 46.0 | 48.8 | 3.7 |
| 29 Total | 871.3 | 888.6 | 69.8 |

¹ ‘Capital requirements’ here and in all tables where the term is used, represents the Pillar 1 capital charge at 8% of RWAs.

Credit risk (including amounts below the thresholds for deduction)

RWAs increased by \$5.2bn in the fourth quarter, including an increase of \$2.8bn due to foreign currency translation differences. The remaining increase of \$2.4bn (excluding foreign currency translation differences) was due to:

- an increase in asset size of \$8.2bn, mainly as a result of corporate and mortgage book growth in Asia;
- increases from model updates of \$5.6bn, mainly in the UK corporate models; less
- savings from RWA initiatives of \$11.9bn, principally from process improvements of \$4.7bn, refined calculations of \$3.3bn, US Consumer and Mortgage Lending (‘CML’) run-off of \$2.2bn and exposure reductions of \$1.7bn.

Counterparty credit risk

RWAs decreased by \$5.7bn, primarily as a result of \$4.5bn savings from RWA initiatives through the increased use of economic hedging.

Securitisation

RWAs decreased by \$7.5bn, mainly as a result of RWA initiatives in the legacy book.

Market risk

RWAs decreased by \$3.7bn, primarily as a result of savings achieved from increased diversification in the IMA book.

Operational risk

RWAs decreased by \$5.3bn at year-end, mainly as a result of \$3.1bn savings realised from RWA initiatives.

Table 11: RWA flow statements of credit risk exposures under the IRB approach^{1, 2}

| | RWAs | Capital required |
|------------------------------|-------|---------------------|
| | \$bn | \$bn |
| 1 At 1 Oct 2017 | 486.1 | 38.9 |
| 2 Asset size | 5.6 | 0.4 |
| 3 Asset quality | 0.1 | — |
| 4 Model updates | 6.5 | 0.6 |
| 5 Methodology and policy | (4.2 |)(0.3 |
| 6 Acquisitions and disposals | — | — |
| 7 Foreign exchange movements | 2.9 | 0.2 |
| 8 Other | — | — |
| 9 At 31 Dec 2017 | 497.0 | 39.8 |

1 This table includes RWA initiatives of \$6.8bn allocated across the RWA flow layers to which they relate.

2 Securitisation positions are not included in this table.

RWAs under the IRB approach increased by \$10.9bn in the fourth quarter of the year, including an increase of \$2.9bn due to foreign currency translation differences.

The remaining increase of \$8.0bn (excluding foreign currency translation differences) was principally due to:

• an increase in asset size of \$5.6bn, principally as a result of corporate and mortgage book growth in Asia;

• an increase in model updates of \$6.5bn, mainly due to corporate model updates in the UK; less

• a decrease in methodology and policy of \$4.2bn, mainly as a result of RWA initiatives.

Pillar 3 Disclosures at 31 December 2017

Table 12: RWA flow statements of CCR exposures under the IMM¹

| | RWAs | Capital required |
|--------------------------|-------|------------------|
| | \$bn | \$bn |
| 1 At 1 Oct 2017 | 13.3 | 1.1 |
| 2 Asset size | (0.1) |)— |
| 3 Asset quality | (0.1) |)— |
| 5 Methodology and policy | (0.6) |)— |
| 9 At 31 Dec 2017 | 12.5 | 1.1 |

¹ This table includes RWA initiatives of \$0.7bn allocated across the RWA flow layers to which they relate. RWAs decreased by \$0.8bn mainly as a result of a change in internal policy.

Table 13: RWA flow statements of market risk exposures under the IMA¹

| | VaR | Stressed VaR | IRC | Other | Total RWAs | Total capital required |
|---------------------------|-------|--------------|-------|-------|------------|------------------------|
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 At 1 Oct 2017 | 8.0 | 15.2 | 12.8 | 2.2 | 38.2 | 3.1 |
| 2 Movement in risk levels | 1.5 | 1.4 | (1.9) | (0.3) | 0.7 | 0.1 |
| 3 Model updates/changes | — | (0.1) |)— | — | (0.1) |)— |
| 4 Methodology and policy | (1.2) | (2.2) | (0.9) |)— | (4.3) | (0.4) |
| 8 At 31 Dec 2017 | 8.3 | 14.3 | 10.0 | 1.9 | 34.5 | 2.8 |

¹ This table includes RWA initiatives of \$1.9bn allocated across the RWA flow layers to which they relate. RWAs decreased by \$3.7bn due to:

- savings of \$4.3bn achieved from increased diversification; less
- increased risk levels of \$0.7bn, mainly as a result of rises in volatility.

Pillar 2 and ICAAP

Pillar 2

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

The ICAAP is reviewed by the PRA and by a college of EEA supervisors, as part of the Joint Risk Assessment and Decision process, during the supervisory review and evaluation process. This process occurs periodically to enable the regulator to define the Individual Capital Guidance ('ICG') or minimum capital requirements for HSBC, and the PRA to define the PRA buffer, where required. Under the revised Pillar 2 PRA regime, which came into effect from 1 January 2017, the capital planning buffer has been replaced with a PRA buffer. This is not intended to duplicate the CRD IV buffers and, where necessary, will be set according to vulnerability in a stress scenario, as assessed through the annual PRA stress testing exercise.

The processes of internal capital adequacy assessment and supervisory review lead to a final determination by the PRA of the ICG and any PRA buffer that may be required.

Within Pillar 2, Pillar 2A considers, in addition to the minimum capital requirements for Pillar 1 risks described above, any supplementary requirements for those risks and any requirements for risk categories not captured by Pillar 1. The risk categories to be covered under Pillar 2A depend on the specific circumstances of a firm and the nature and scale of its business.

Pillar 2B consists of guidance from the PRA on the capital buffer a firm would require in order to remain above its ICG in adverse circumstances that may be largely outside the firm's normal and direct control; for example, during a period of severe but plausible

downturn stress, when asset values and the firm's capital surplus may become strained. This is quantified via any PRA buffer requirement the PRA may consider necessary. The assessment of this is informed by stress tests and a rounded judgement of a firm's business model, also taking into account the PRA's view of a firm's options and capacity to protect its capital position under stress; for instance, through capital generation. Where the PRA assesses that a firm's risk management and governance are significantly weak, it may also increase the PRA buffer to cover the risks posed by those weaknesses until they are addressed. The PRA buffer is intended to be drawn upon in times of stress, and its use is not of itself a breach of capital requirements that would trigger automatic restrictions on distributions. In specific circumstances, the PRA should agree a plan with a firm for its restoration over an agreed timescale.

Internal capital adequacy assessment

The Board manages the Group ICAAP, and together with RMM and GRC, it examines the Group's risk profile from both regulatory and economic capital viewpoints, aiming to ensure that capital resources:

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

The minimum regulatory capital that we are required to hold is determined by the rules and guidance established by the PRA for the consolidated Group and by local regulators for individual Group companies. These capital requirements are a primary influence shaping the business planning process, in which RWA targets are established for our global businesses in accordance with the Group's strategic direction and risk appetite.

Economic capital is the internally calculated capital requirement that we deem necessary to support the risks to which we are exposed. The economic capital assessment is a more risk-sensitive measure than the regulatory minimum, and takes account of the substantial diversification of risk accruing from our operations. Both the regulatory and the economic capital assessments rely upon the use of models that are integrated into our management of risk. Our economic capital models are calibrated to quantify the level of capital that is sufficient to absorb potential losses over a one-year time horizon to a 99.95% level of confidence for our

banking and trading activities, to a 99.5% level of confidence for our insurance activities and pension risks, and to a 99.9% level of confidence for our operating risks.

The ICAAP and its constituent economic capital calculations are examined by the PRA as part of its supervisory review and evaluation process. This examination informs the regulator's view of our Pillar 2 capital requirements. Preserving our strong capital position remains a priority, and the level of integration of our risk and capital management helps to optimise our response to business demand for regulatory and economic capital. Risks that are explicitly assessed through economic capital are credit risk, including CCR, market and operational risk, interest rate risk in the banking book, insurance risk, pension risk, residual risk and structural foreign exchange risk.

Credit risk

Overview and responsibilities

Credit risk represents our largest regulatory capital requirement.

The principal objectives of our credit risk management function are:

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

The credit risk functions within Wholesale Credit and Market Risk and RBWM are the constituent parts of Global Risk that support the Group Chief Risk Officer in overseeing credit risks. Their major duties comprise undertaking independent reviews of large and high-risk credit proposals, overseeing large exposure policy and reporting on our wholesale and retail credit risk management disciplines, owning our credit policy and credit systems programmes, overseeing portfolio management and reporting on risk matters to senior executive management and to regulators. These credit risk functions work closely with other parts of Global Risk; for example, with Operational Risk on the internal control framework and with Risk Strategy on the risk appetite process. In addition, they work jointly with Risk Strategy and Global Finance on stress testing.

The credit responsibilities of Global Risk are described on page 107 of the Annual Report and Accounts 2017.

Group-wide, the credit risk functions comprise a network of credit risk management offices reporting within regional risk functions. They fulfil an essential role as independent risk control units distinct from business line management in providing objective scrutiny of risk rating assessments, credit proposals for approval and other risk matters.

Credit risk operates through a hierarchy of personal credit limit approval authorities. Operating company chief executives, acting under authorities delegated by their boards and Group standards, are accountable for credit risk and other risks in their business. In turn, chief executives delegate authority to operating company chief risk officers and management teams on an individual basis. Each operating company is responsible for the quality and performance of its credit portfolios in accordance with Group standards. Above these thresholds of delegated personal credit limited approval authorities, approval must be sought from the regional and, as appropriate, global credit risk function.

Credit risk management

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

as well as updates on specific portfolios that are considered to have heightened credit risk.

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

Risk rating systems for retail exposures are generally quantitative in nature, applying techniques such as behavioural analysis across product portfolios comprising large numbers of homogeneous transactions. Rating systems for

individually managed relationships typically use customer financial statements and market data analysis, but also qualitative elements and a final subjective overlay to better reflect any idiosyncratic elements of the customer's risk profile. See 'Application of the IRB Approach' on page 34.

A fundamental principle of our policy and approach is that analytical risk rating systems and scorecards are all valuable tools at the disposal of management.

The credit process provides for at least an annual review of facility limits granted. Review may be more frequent, as required by circumstances such as the emergence of adverse risk factors.

We constantly seek to improve the quality of our risk management. Group 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.

Group standards govern the process through which risk rating systems are initially developed, judged fit for purpose, approved and implemented. They also govern the conditions under which analytical risk model outcomes can be overridden by decision-takers and the process of model performance monitoring and reporting. The emphasis is on an effective dialogue between business line and risk management, suitable independence of decision-takers, and a good understanding and robust challenge on the part of senior management.

Like other facets of risk management, analytical risk rating systems are not static; they are subject to review and modification in light of the changing environment, the greater availability and quality of data, and any deficiencies identified through internal and external regulatory review. Structured processes and metrics are in place to capture relevant data and feed this into continuous model improvement. See also the comments on 'Model performance' on page 46.

Credit risk models governance

All new or materially changed IRB capital models require the PRA's approval, as set out in more detail on page 34, and throughout HSBC such models fall directly under the remit of the global functional MOCs, operating in line with HSBC's model risk policy, and under the oversight of the Global MOC. Additionally, the global functional MOCs are responsible for the approval of stress testing models used for regulatory stress testing exercises such as those carried out by the EBA and the BoE.

Both the Wholesale and RBWM MOCs require all credit risk models for which they are responsible to be approved by delegated senior managers with notification to the committees that retain the responsibility for oversight.

Global Risk sets internal standards for the development, validation, independent review, approval, implementation and performance monitoring of credit risk rating models. Independent reviews of our models are performed by our Independent Model Review (IMR) function which is separate from our Risk Analytics functions that are responsible for the development of models.

Compliance with Group standards is subject to examination by Risk oversight and review from within the Risk function itself, and by Internal Audit.

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IFRS 9

IFRS 9 introduces new accounting concepts and measures such as significant credit deterioration and lifetime loss measurement. Existing stress testing and regulatory models, skills and expertise were harnessed and leveraged in order to meet the IFRS 9 requirements. Data from various client, finance and risk systems are integrated and validated. As a result of IFRS 9 adoption, management has additional insight and measures not previously

available which, over time, may influence our risk appetite and risk management processes.

Credit quality of assets

We are a universal bank with a conservative approach to credit risk. This is reflected in our credit risk profile being diversified across a number of asset classes and geographies with a credit quality profile mainly concentrated in the higher quality bands.

Table 14: Credit quality of exposures by exposure classes and instruments

| | Gross carrying values of | | Specific credit risk adjustments | Write-offs in the year | Credit risk adjustment charges of the period | Net carrying values ¹ |
|---|--------------------------|----------------------------|-------------------------------------|---------------------------|--|--|
| | Defaulted exposures | Non-defaulted exposures | | | | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Central governments and central banks | — | 308.1 | — | — | — | 308.1 |
| 2 Institutions | — | 94.5 | — | — | — | 94.5 |
| 3 Corporates | 8.1 | 987.5 | 4.2 | 1.0 | 0.7 | 991.4 |
| – of which: | | | | | | |
| 4 specialised lending | 1.2 | 47.5 | 0.3 | — | — | 48.4 |
| 6 Retail | 3.6 | 465.0 | 1.0 | 0.7 | 0.3 | 467.6 |
| 7 – secured by real estate property | 2.5 | 274.3 | 0.3 | — | — | 276.5 |
| – of which: | | | | | | |
| 8 SMEs | — | 1.5 | — | — | — | 1.5 |
| 9 Non-SMEs | 2.5 | 272.8 | 0.3 | — | — | 275.0 |
| 10 – qualifying revolving retail | 0.1 | 125.4 | 0.2 | 0.3 | 0.2 | 125.3 |
| 11 – other retail | 1.0 | 65.3 | 0.5 | 0.4 | 0.1 | 65.8 |
| – of which: | | | | | | |
| 12 SMEs | 0.6 | 10.6 | 0.3 | — | — | 10.9 |
| 13 Non-SMEs | 0.4 | 54.7 | 0.2 | 0.4 | 0.1 | 54.9 |
| 15 Total IRB approach | 11.7 | 1,855.1 | 5.2 | 1.7 | 1.0 | 1,861.6 |
| 16 Central governments and central banks | — | 198.1 | — | — | — | 198.1 |
| Regional | | | | | | |
| 17 governments or local authorities | — | 3.8 | — | — | — | 3.8 |
| 18 Public sector entities | — | 0.4 | — | — | — | 0.4 |
| 19 Multilateral development banks | — | 0.3 | — | — | — | 0.3 |
| 20 International organisations | — | 2.2 | — | — | — | 2.2 |
| 21 Institutions | — | 3.5 | — | — | — | 3.5 |
| 22 Corporates | — | 172.8 | 0.5 | — | 0.1 | 172.3 |
| 23 – of which: SMEs | — | 1.1 | — | — | — | 1.1 |

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| | | | | | | | |
|----|--|------|---------|-----|-----|-----|---------|
| 24 | Retail | — | 71.0 | 0.4 | — | 0.2 | 70.6 |
| 25 | – of which: SMEs | — | 1.7 | — | — | — | 1.7 |
| | Secured by mortgages | | | | | | |
| 26 | on immovable property | — | 29.0 | — | — | — | 29.0 |
| 27 | – of which: SMEs | — | 0.1 | — | — | — | 0.1 |
| 28 | Exposures in default ² | 5.4 | — | 2.0 | 1.5 | 0.7 | 3.4 |
| 29 | Items associated with particularly high risk | — | 3.9 | — | — | — | 3.9 |
| 32 | Collective investment undertakings ('CIU') | — | 0.6 | — | — | — | 0.6 |
| 33 | Equity exposures | — | 16.0 | — | — | — | 16.0 |
| 34 | Other exposures | — | 11.9 | — | — | — | 11.9 |
| 35 | Total standardised approach | 5.4 | 513.5 | 2.9 | 1.5 | 1.0 | 516.0 |
| 36 | Total at 31 Dec 2017 | 17.1 | 2,368.6 | 8.1 | 3.2 | 2.0 | 2,377.6 |
| | – of which: loans | 15.1 | 1,225.2 | 7.8 | 3.2 | 2.0 | 1,232.5 |
| | – of which: debt securities | — | 325.1 | — | — | — | 325.1 |
| | – of which: off-balance sheet exposures | 2.0 | 782.4 | 0.2 | — | — | 784.2 |

¹ Securitisation positions and non-credit obligation assets are not included in this table.

² Exposures in default comprises principally defaulted exposure to corporates of \$3.3bn, retail clients of \$1.1bn and exposure secured on immovable property of \$1.0bn.

Table 15: Credit quality of exposures by industry or counterparty types

| | Gross carrying values of | | Specific credit risk adjustments | Write-offs in the year | Credit risk adjustment charges of the period | Net carrying values ¹ |
|------------------------------------|--------------------------|----------------------------|-------------------------------------|---------------------------|--|--|
| | Defaulted exposures | Non-defaulted exposures | | | | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Agriculture | 0.4 | 9.5 | 0.1 | — | — | 9.8 |
| 2 Mining | 1.4 | 42.2 | 0.5 | 0.2 | (0.1) | 43.1 |
| 3 Manufacturing | 2.3 | 254.2 | 1.2 | 0.3 | 0.2 | 255.3 |
| 4 Utilities | 0.3 | 33.9 | 0.1 | 0.1 | — | 34.1 |
| 5 Water supply | — | 3.0 | — | — | — | 3.0 |
| 6 Construction | 1.0 | 39.2 | 0.3 | 0.1 | — | 39.9 |
| 7 Wholesale & retail trade | 2.4 | 203.5 | 1.4 | 0.4 | 0.5 | 204.5 |
| 8 Transportation & storage | 0.5 | 52.1 | 0.1 | — | — | 52.5 |
| 9 Accommodation & food services | 0.3 | 24.9 | 0.1 | — | — | 25.1 |
| 10 Information & communication | 0.1 | 10.0 | — | 0.1 | — | 10.1 |
| 11 Financial & insurance | 0.4 | 553.0 | 0.8 | 0.1 | 0.1 | 552.6 |
| 12 Real estate | 1.2 | 220.9 | 0.9 | 0.1 | 0.2 | 221.2 |
| 13 Professional activities | 0.2 | 19.2 | — | — | — | 19.4 |
| 14 Administrative service | 0.9 | 81.6 | 0.7 | 0.1 | 0.1 | 81.8 |
| 15 Public admin & defence | 0.3 | 172.8 | — | — | — | 173.1 |
| 16 Education | — | 3.7 | — | — | — | 3.7 |
| 17 Human health & social work | 0.2 | 7.6 | — | — | — | 7.8 |
| 18 Arts & entertainment | 0.1 | 8.9 | — | — | — | 9.0 |
| 19 Other services | 0.1 | 10.4 | — | — | — | 10.5 |
| 20 Personal | 5.0 | 554.7 | 1.9 | 1.7 | 1.0 | 557.8 |
| 21 Extraterritorial bodies | — | 39.5 | — | — | — | 39.5 |
| 22 Total at 31 Dec 2017 | 17.1 | 2,344.8 | 8.1 | 3.2 | 2.0 | 2,353.8 |

1 Securitisation positions and non-customer assets are not included in this table.

Table 16: Credit quality of exposures by geography¹

| | Gross carrying values of | | Specific credit risk adjustments | Write-offs in the year | Credit risk adjustment charges of the period | Net carrying values ² |
|-------------------|--------------------------|----------------------------|-------------------------------------|---------------------------|--|-------------------------------------|
| | Defaulted exposures | Non-defaulted exposures | | | | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Europe | 8.1 | 795.6 | 3.0 | 1.2 | 0.8 | 800.7 |
| 2 United Kingdom | 4.1 | 465.3 | 1.8 | 0.7 | 0.7 | 467.6 |
| 3 France | 1.2 | 121.5 | 0.6 | 0.1 | — | 122.1 |
| 4 Other countries | 2.8 | 208.8 | 0.6 | 0.4 | 0.1 | 211.0 |

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| | | | | | | | |
|----|-----------------------------|------|---------|-----|-----|-------|---------|
| 5 | Asia | 2.5 | 970.7 | 1.7 | 0.6 | 0.6 | 971.5 |
| 6 | Hong Kong | 0.9 | 465.5 | 0.5 | 0.3 | 0.4 | 465.9 |
| 7 | China | 0.3 | 167.2 | 0.3 | 0.1 | 0.1 | 167.2 |
| 8 | Singapore | 0.1 | 70.2 | 0.1 | — | — | 70.2 |
| 9 | Other countries | 1.2 | 267.8 | 0.8 | 0.2 | 0.1 | 268.2 |
| 10 | MEA | 2.9 | 134.1 | 1.8 | 0.4 | 0.2 | 135.2 |
| 11 | North America | 2.6 | 387.6 | 1.0 | 0.3 | (0.1) |)389.2 |
| 12 | United States of America | 1.5 | 268.9 | 0.4 | 0.1 | — | 270.0 |
| 13 | Canada | 0.4 | 100.9 | 0.3 | 0.1 | (0.1) |)101.0 |
| 14 | Other countries | 0.7 | 17.8 | 0.3 | 0.1 | — | 18.2 |
| 15 | Latin America Other | 1.0 | 62.3 | 0.6 | 0.7 | 0.5 | 62.7 |
| 16 | geographical areas | — | 18.3 | — | — | — | 18.3 |
| 17 | Total at 31 Dec 2017 | 17.1 | 2,368.6 | 8.1 | 3.2 | 2.0 | 2,377.6 |

¹ Amounts shown by geographical region and country in this table are based on the country of residence of the counterparty.

² Securitisation positions and non-credit obligation assets are not included in this table.

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Table 17: Ageing of past-due unimpaired and impaired exposures

| | Gross carrying values | | | | | |
|----------------------------------|-----------------------|------------------------------|------------------------------|-------------------------------|-----------------------------------|---------------------------|
| | Less than 30 days | Between 30 and 60 days | Between 60 and 90 days | Between 90 and 180 days | Between 180 days and 1 year | Greater than 1 year |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Loans | 7.6 | 1.5 | 0.8 | 2.0 | 0.9 | 4.1 |
| 2 Debt securities | — | — | — | — | — | — |
| 3 Total exposures at 31 Dec 2017 | 7.6 | 1.5 | 0.8 | 2.0 | 0.9 | 4.1 |

Table 18: Non-performing and forborne exposures

| | Gross carrying values of performing and non-performing exposures | | | | | | | | Accumulated impairment and provisions and negative fair value adjustments due to credit risk | | | | Collateral and guarantees received | |
|---------------------|--|------|---------------------------------------|------|--|------|---|-------|--|-------|---|-------|------------------------------------|-----------------------------|
| | of which performing but past due between 30 and 90 days | | of which performing of which forborne | | of which non-performing of which defaulted | | of which non-performing of which impaired | | On performing exposures of which forborne | | On non-performing exposures of which impaired | | | On non-performing exposures |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | | |
| 1 Debt securities | 325.1 | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2 Loans Off-balance | 1,240.3 | 1.7 | 2.5 | 15.8 | 15.1 | 15.8 | 6.7 | (2.4) | (0.1) | (5.5) | (1.9) | (6.2) | 6.2 | |
| 3 sheet exposures | 784.4 | — | 0.3 | 2.0 | 2.0 | — | — | (0.2) | — | — | — | — | 0.2 | |

This table is presented based on the EBA definitions of 'non-performing' and 'forborne' exposures. Forborne exposures are referred to as Renegotiated Loans in the Annual Report and Accounts 2017. In the Annual Report and Accounts 2017 we classify and report loans on which concessions have been granted under conditions of credit distress as 'renegotiated loans' when their contractual payment terms have been modified because we have significant concerns about the borrowers' ability to meet contractual payments when due. This is aligned to the EBA definitions of forborne exposures. The EBA and Annual Report and Accounts 2017 differ in the treatment of cures from the forborne/renewed status. Under the EBA definition, exposures are no longer considered forborne once the exposures have complied with the revised contractual obligations for a period of at least

three years and the exposures are no longer considered impaired or have any elements that are more than 30 days past due. Under the Annual Report and Accounts 2017 definition, renegotiated loans retain this classification until maturity or derecognition. The EBA definition of non-performing captures those exposures that have material exposures which are more than 90 days past due or the debtors is assessed as unlikely to pay its credit obligations in full without the realisation of collateral, regardless of the existence of any past due amounts. Any debtors that are in default for regulatory purposes or impaired under the applicable accounting framework are considered to be unlikely to pay. The Annual Report and Accounts 2017 does not have a non-performing exposure category however the definition of impaired loans is well aligned to the EBA non-performing definitions.

Table 19: Credit risk exposure – summary

| | Footnotes | Net carrying values \$bn | Average net carrying values ³ \$bn | RWAs \$bn | Capital required \$bn |
|--|-----------|-----------------------------|--|--------------|--------------------------|
| IRB advanced approach | | 1,788.2 | 1,729.1 | 455.4 | 36.4 |
| – central governments and central banks | | 308.1 | 320.9 | 33.9 | 2.7 |
| – institutions | | 94.3 | 92.1 | 17.6 | 1.4 |
| – corporates | 1 | 918.2 | 870.6 | 338.2 | 27.0 |
| – total retail | | 467.6 | 445.5 | 65.7 | 5.3 |
| – of which: | | | | | |
| secured by mortgages on immovable property SME | | 1.5 | 1.5 | 0.5 | — |
| secured by mortgages on immovable property non-SME | | 275.0 | 260.5 | 33.2 | 2.7 |
| qualifying revolving retail | | 125.3 | 120.2 | 16.0 | 1.3 |
| other SME | | 10.9 | 10.2 | 5.9 | 0.5 |
| other non-SME | | 54.9 | 53.1 | 10.1 | 0.8 |
| IRB securitisation positions | | 32.8 | 33.9 | 13.7 | 1.1 |
| IRB non-credit obligation assets | | 56.1 | 55.2 | 13.2 | 1.1 |
| IRB foundation approach | | 73.4 | 71.2 | 28.4 | 2.3 |
| – central governments and central banks | | — | — | — | — |
| – institutions | | 0.2 | 0.2 | 0.1 | — |
| – corporates | | 73.2 | 71.0 | 28.3 | 2.3 |
| Standardised approach | | 518.0 | 483.1 | 174.5 | 13.9 |
| – central governments and central banks | | 198.1 | 173.1 | 12.7 | 1.0 |
| – institutions | | 3.5 | 2.9 | 1.2 | 0.1 |
| – corporates | | 172.3 | 167.8 | 78.3 | 6.3 |
| – retail | | 70.6 | 68.9 | 16.5 | 1.3 |
| – secured by mortgages on immovable property | | 29.0 | 27.6 | 10.4 | 0.8 |
| – exposures in default | | 3.4 | 3.6 | 3.9 | 0.3 |
| – regional governments or local authorities | | 3.8 | 3.2 | 1.0 | 0.1 |
| – public sector entities | | 0.4 | 0.2 | 0.1 | — |
| – equity | 2 | 16.0 | 15.9 | 36.1 | 2.9 |
| – items associated with particularly high risk | | 3.9 | 3.9 | 5.7 | 0.5 |
| – securitisation positions | | 2.0 | 1.3 | 1.6 | 0.1 |
| – claims in the form of collective investment undertakings ('CIU') | | 0.6 | 0.5 | 0.6 | — |
| – international organisations | | 2.2 | 2.5 | — | — |
| – multilateral development banks | | 0.3 | 0.3 | — | — |
| – other items | | 11.9 | 11.4 | 6.4 | 0.5 |
| Total at 31 Dec 2017 | | 2,468.5 | 2,372.5 | 685.2 | 54.8 |

¹ Corporates includes specialised lending net carrying value subject to supervisory slotting approach of \$37.6bn (2016: \$34.1bn) and RWAs of \$23.6bn (2016: \$22.2bn).

² This includes investments in insurance companies that are risk weighted at 250%.

³ Average net carrying values are calculated by aggregating net carrying values of the last five quarters and dividing by five.

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Table 20: Geographical breakdown of exposures

| | Net carrying values ^{1,2} | | | | | | | | | |
|--|--|----------------|--------|-----------------|-------|-----------|-------|-----------|-----------------|-------|
| | Europe: | United Kingdom | France | Other countries | Asia: | Hong Kong | China | Singapore | Other countries | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | |
| IRB approach exposure classes | | | | | | | | | | |
| 1 | Central governments and central banks | 6.8 | — | — | 6.8 | 171.8 | 55.9 | 30.8 | 13.1 | 72.0 |
| 2 | Institutions | 23.9 | 11.1 | 1.8 | 11.0 | 48.0 | 9.0 | 18.6 | 3.7 | 16.7 |
| 3 | Corporates | 299.5 | 170.2 | 47.5 | 81.8 | 427.2 | 194.1 | 83.2 | 31.6 | 118.3 |
| 4 | Retail | 226.5 | 198.3 | 26.2 | 2.0 | 185.5 | 148.3 | 6.0 | 6.3 | 24.9 |
| 6 | Total IRB approach | 556.7 | 379.6 | 75.5 | 101.6 | 832.5 | 407.3 | 138.6 | 54.7 | 231.9 |
| Standardised approach exposure classes | | | | | | | | | | |
| 7 | Central governments and central banks | 193.1 | 75.8 | 39.4 | 77.9 | 0.9 | 0.3 | 0.1 | — | 0.5 |
| 8 | Regional governments or local authorities | — | — | — | — | — | — | — | — | — |
| 9 | Public sector entities | 0.3 | — | — | 0.3 | — | — | — | — | — |
| 10 | Multilateral development banks | — | — | — | — | — | — | — | — | — |
| 11 | International organisations | — | — | — | — | — | — | — | — | — |
| 12 | Institutions | 1.1 | — | 0.8 | 0.3 | 0.1 | 0.1 | — | — | — |
| 13 | Corporates | 30.2 | 3.0 | 2.7 | 24.5 | 60.0 | 37.7 | 5.3 | 6.7 | 10.3 |
| 14 | Retail | 4.2 | 1.2 | 1.8 | 1.2 | 41.7 | 11.4 | 3.1 | 8.2 | 19.0 |
| 15 | Secured by mortgages on immovable property SME | 5.6 | 1.2 | 0.8 | 3.6 | 16.5 | 3.4 | 7.8 | 0.4 | 4.9 |
| 16 | Exposures in default | 1.0 | 0.1 | 0.1 | 0.8 | 0.5 | 0.1 | — | — | 0.4 |
| 17 | Items associated with particularly high risk | 2.4 | 1.3 | 0.4 | 0.7 | — | — | — | — | — |
| 20 | Collective investment undertakings ('CIU') | 0.6 | 0.6 | — | — | — | — | — | — | — |
| 21 | Equity exposures | 1.2 | 1.1 | 0.1 | — | 13.3 | 1.6 | 11.4 | 0.2 | 0.1 |
| 22 | Other exposures | 4.3 | 3.7 | 0.5 | 0.1 | 6.0 | 4.0 | 0.9 | — | 1.1 |
| 23 | Total standardised approach | 244.0 | 88.0 | 46.6 | 109.4 | 139.0 | 58.6 | 28.6 | 15.5 | 36.3 |
| 24 | Total at 31 Dec 2017 | 800.7 | 467.6 | 122.1 | 211.0 | 971.5 | 465.9 | 167.2 | 70.2 | 268.2 |

Table 20: Geographical breakdown of exposures (continued)

| | Net carrying values ^{1,2} | | | | | | | | | |
|-------------------------------|---------------------------------------|----------------|--------------------------|-----------------|---------------|-------|-------|------|------|---------|
| | MEA | North America: | United States of America | Other countries | Latin America | Other | Total | | | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | |
| IRB approach exposure classes | | | | | | | | | | |
| 1 | Central governments and central banks | 16.8 | 87.2 | 69.6 | — | 17.5 | 0.1 | 10.2 | 15.3 | 308.1 |
| 2 | Institutions | 5.5 | 15.2 | 7.9 | — | 7.3 | — | 1.4 | 0.5 | 94.5 |
| 3 | Corporates | 42.6 | 210.7 | 149.4 | — | 50.8 | 10.5 | 11.4 | — | 991.4 |
| 4 | Retail | 2.4 | 53.1 | 27.1 | — | 22.9 | 3.1 | 0.1 | — | 467.6 |
| 6 | Total IRB approach | 67.3 | 366.2 | 254.0 | — | 98.5 | 13.7 | 23.1 | 15.8 | 1,861.6 |

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| Standardised approach exposure classes | | | | | | | | | |
|--|--|-------|-------|-------|-------|------|------|------|---------|
| 7 | Central governments and central banks | 1.1 | 2.4 | 2.3 | 0.1 | — | 0.6 | — | 198.1 |
| 8 | Regional governments or local authorities | 3.1 | — | — | — | — | 0.7 | — | 3.8 |
| 9 | Public sector entities | — | — | — | — | — | 0.1 | — | 0.4 |
| 10 | Multilateral development banks | — | — | — | — | — | — | 0.3 | 0.3 |
| 11 | International organisations | — | — | — | — | — | — | 2.2 | 2.2 |
| 12 | Institutions | 2.2 | — | — | — | — | 0.1 | — | 3.5 |
| 13 | Corporates | 45.8 | 11.9 | 9.7 | 0.3 | 1.9 | 24.4 | — | 172.3 |
| 14 | Retail | 10.3 | 3.9 | 1.8 | 1.6 | 0.5 | 10.5 | — | 70.6 |
| 15 | Secured by mortgages on immovable property SME | 3.2 | 1.5 | 0.2 | 0.1 | 1.2 | 2.2 | — | 29.0 |
| 16 | Exposures in default | 1.3 | 0.2 | — | — | 0.2 | 0.4 | — | 3.4 |
| 17 | Items associated with particularly high risk | 0.2 | 1.2 | 0.5 | — | 0.7 | 0.1 | — | 3.9 |
| 20 | Collective investment undertakings ('CIU') | — | — | — | — | — | — | — | 0.6 |
| 21 | Equity exposures | 0.2 | 1.0 | 1.0 | — | — | 0.3 | — | 16.0 |
| 22 | Other exposures | 0.5 | 0.9 | 0.5 | 0.4 | — | 0.2 | — | 11.9 |
| 23 | Total standardised approach | 67.9 | 23.0 | 16.0 | 2.5 | 4.5 | 39.6 | 2.5 | 516.0 |
| 24 | Total at 31 Dec 2017 | 135.2 | 389.2 | 270.0 | 101.0 | 18.2 | 62.7 | 18.3 | 2,377.6 |

¹ Amounts shown by geographical region and country in this table are based on the country of residence of the counterparty.

² Securitisation positions and non-credit obligation assets are not included in this table.

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Table 21: Concentration of exposures by industry or counterparty types

| | Agriculture | Mining | Manufacturing | Utilities | Water supply | Construction | Wholesale & retail trade | Transportation & storage | Accommodation & food services | Insurance |
|--|-------------|--------|---------------|-----------|--------------|--------------|--------------------------|--------------------------|-------------------------------|-----------|
| Net carrying values ¹ | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB approach exposure classes | | | | | | | | | | |
| Central | | | | | | | | | | |
| 1 governments and central banks | — | — | — | — | — | — | — | — | — | — |
| 2 Institutions | — | 0.3 | — | — | — | — | — | — | — | — |
| 3 Corporates | 7.3 | 38.9 | 226.8 | 29.3 | 2.8 | 31.8 | 174.0 | 47.9 | 21.0 | 7.7 |
| 4 Retail | 1.0 | — | 0.7 | — | — | 0.3 | 1.7 | 0.3 | 0.4 | — |
| 6 Total IRB approach | 8.3 | 39.2 | 227.5 | 29.3 | 2.8 | 32.1 | 175.7 | 48.2 | 21.4 | 7.7 |
| Standardised approach exposure classes | | | | | | | | | | |
| Central | | | | | | | | | | |
| 7 governments and central banks | — | — | — | — | — | — | — | — | — | — |
| Regional | | | | | | | | | | |
| 8 governments or local authorities | — | — | — | — | — | — | — | — | — | — |
| 9 Public sector entities | — | — | — | — | — | — | — | — | — | — |
| 10 Multilateral development banks | — | — | — | — | — | — | — | — | — | — |
| International | | | | | | | | | | |
| 11 organisations | — | — | — | — | — | — | — | — | — | — |
| 12 Institutions | — | — | — | — | — | — | — | — | — | — |
| 13 Corporates | 1.3 | 3.8 | 26.6 | 4.8 | 0.2 | 7.4 | 28.0 | 4.3 | 3.6 | 1.9 |
| 14 Retail | 0.1 | — | 0.2 | — | — | — | 0.5 | — | — | — |
| Secured by mortgages on | | | | | | | | | | |
| 15 immovable property | — | — | — | — | — | 0.1 | — | — | — | — |
| SME | | | | | | | | | | |
| 16 Exposures in default | 0.1 | 0.1 | 0.7 | — | — | 0.2 | 0.3 | — | 0.1 | — |
| 17 Items associated | — | — | — | — | — | 0.1 | — | — | — | — |

| | | | | | | | | | | | |
|--|----|-----|------|-------|------|-----|------|-------|------|------|-----|
| with particularly high risk Collective investment undertakings ('CIU') | 20 | — | — | — | — | — | — | — | — | — | — |
| Equity exposures | 21 | — | — | 0.1 | — | — | — | — | — | — | 0.5 |
| Other exposures | 22 | — | — | 0.2 | — | — | — | — | — | — | — |
| Total standardised approach | 23 | 1.5 | 3.9 | 27.8 | 4.8 | 0.2 | 7.8 | 28.8 | 4.3 | 3.7 | 2.4 |
| Total at 31 Dec 2017 | 24 | 9.8 | 43.1 | 255.3 | 34.1 | 3.0 | 39.9 | 204.5 | 52.5 | 25.1 | 10 |

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Table 21: Concentration of exposures by industry or counterparty types (continued)

| | Real estate | Professional activities | Administrative service | Public & defence | Education | Human health & social work | Arts & entertainment | Other services | Personal | Extra-territorial bodies |
|--|-------------|-------------------------|------------------------|------------------|-----------|----------------------------|----------------------|----------------|----------|--------------------------|
| Net carrying values ¹ | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB approach exposure classes | | | | | | | | | | |
| Central | | | | | | | | | | |
| 1 governments and central banks | — | — | — | 139.6 | — | 0.1 | 0.1 | — | — | 27.3 |
| 2 Institutions | — | — | — | 0.1 | — | — | — | — | — | — |
| 3 Corporates | 180.0 | 18.0 | 53.0 | 0.8 | 3.2 | 6.1 | 8.3 | 8.5 | — | — |
| 4 Retail | 0.7 | — | 0.7 | — | 0.1 | 0.3 | 0.1 | 0.4 | 460.8 | — |
| 6 Total IRB approach | 180.7 | 18.0 | 53.7 | 140.5 | 3.3 | 6.5 | 8.5 | 8.9 | 460.8 | 27.3 |
| Standardised approach exposure classes | | | | | | | | | | |
| Central | | | | | | | | | | |
| 7 governments and central banks | — | — | — | 29.2 | — | — | — | — | — | 10.3 |
| Regional | | | | | | | | | | |
| 8 governments or local authorities | — | — | — | 2.3 | — | — | — | — | — | — |
| 9 Public sector entities | — | — | — | 0.4 | — | — | — | — | — | — |
| Multilateral | | | | | | | | | | |
| 10 development banks | — | — | — | — | — | — | — | — | — | — |
| 11 International organisations | — | — | — | 0.3 | — | — | — | — | — | 1.9 |
| 12 Institutions | — | — | — | — | — | — | — | — | — | — |
| 13 Corporates | 38.7 | 1.3 | 27.0 | 0.4 | 0.4 | 1.3 | 0.5 | 1.4 | 0.6 | — |
| 14 Retail | 0.6 | 0.1 | 0.4 | — | — | — | — | 0.1 | 67.0 | — |
| Secured by mortgages on | | | | | | | | | | |
| 15 immovable property SME | 0.8 | — | — | — | — | — | — | — | 28.1 | — |

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| | | | | | | | | | | | |
|----|---|-------|------|------|-------|-----|-----|-----|------|-------|------|
| 16 | Exposures in default | 0.2 | — | 0.3 | — | — | — | — | — | 1.3 | — |
| | Items associated with particularly high risk Collective investment undertakings ('CIU') | | | | | | | | | | |
| 17 | | 0.2 | — | 0.2 | — | — | — | — | — | — | — |
| 20 | Equity exposures | — | — | 0.1 | — | — | — | — | 0.1 | — | — |
| 21 | Other exposures | — | — | 0.1 | — | — | — | — | — | — | — |
| 22 | Total | 40.5 | 1.4 | 28.1 | 32.6 | 0.4 | 1.3 | 0.5 | 1.6 | 97.0 | 12.2 |
| 23 | standardised approach | | | | | | | | | | |
| 24 | Total at 31 Dec 2017 | 221.2 | 19.4 | 81.8 | 173.1 | 3.7 | 7.8 | 9.0 | 10.5 | 557.8 | 39.5 |

1 Securitisation positions and non-customer assets are not included in this table.

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Table 22: Maturity of on-balance sheet exposures

| | Net carrying values ¹ | | | | Undated | Total |
|---|----------------------------------|------------------|-----------------------|-------------------|---------|---------|
| | On demand | Less than 1 year | Between 1 and 5 years | More than 5 years | | |
| Footnotes | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB approach exposure classes | | | | | | |
| 1 Central governments and central banks | 38.8 | 139.9 | 82.2 | 44.9 | — | 305.8 |
| 2 Institutions | 6.5 | 51.5 | 22.1 | 0.8 | — | 80.9 |
| 3 Corporates | 60.6 | 163.7 | 214.3 | 62.6 | — | 501.2 |
| 4 Retail | 21.1 | 10.0 | 38.8 | 254.1 | — | 324.0 |
| 6 Total IRB approach | 127.0 | 365.1 | 357.4 | 362.4 | — | 1,211.9 |
| Standardised approach exposure classes | | | | | | |
| 7 Central governments and central banks | 41.7 | 99.2 | 40.1 | 10.9 | 5.0 | 196.9 |
| 8 Regional governments or local authorities | 0.8 | 0.4 | 0.2 | 1.9 | — | 3.3 |
| 9 Public sector entities | — | 0.1 | — | 0.1 | — | 0.2 |
| 10 Multilateral development banks | — | 0.1 | — | 0.2 | — | 0.3 |
| 11 International organisations | — | 0.4 | 1.3 | 0.5 | — | 2.2 |
| 12 Institutions | 0.1 | 1.5 | 1.5 | 0.3 | — | 3.4 |
| 13 Corporates | 3.8 | 53.3 | 23.6 | 7.9 | — | 88.6 |
| 14 Retail | 7.7 | 3.5 | 9.5 | 3.1 | — | 23.8 |
| 15 Secured by mortgages on immovable property SME | — | 2.0 | 4.9 | 20.9 | — | 27.8 |
| 16 Exposures in default | 0.3 | 1.1 | 1.0 | 0.7 | — | 3.1 |
| 17 Items associated with particularly high risk | — | 0.1 | 0.7 | 0.4 | 0.9 | 2.1 |
| 20 Collective investment undertakings ('CIU') | — | — | — | 0.1 | 0.5 | 0.6 |
| 21 Equity exposures | — | — | — | — | 16.0 | 16.0 |
| 22 Other exposures | — | 0.1 | — | 0.2 | 10.8 | 11.1 |
| 23 Total standardised approach | 54.4 | 161.8 | 82.8 | 47.2 | 33.2 | 379.4 |
| 24 Total at 31 Dec 2017 | 181.4 | 526.9 | 440.2 | 409.6 | 33.2 | 1,591.3 |

1 Securitisation positions and non-credit obligation assets are not included in this table.

Past due but not impaired exposures, impaired exposures, renegotiated exposures and credit risk adjustments

Tables 23 and 24 analyse past due but not impaired exposures, impaired exposures, renegotiated exposures and impairment allowances and other credit risk provisions on a regulatory consolidation basis. These tables use accounting values. The main differences between the amounts presented here and those on a financial consolidation basis are: the proportional consolidation of associates in the regulatory consolidation; the regulatory consolidation excluding special purpose entities where significant risk has been transferred to third parties; and the exclusion of exposures treated under the securitisation approach.

Our approach for determining impairment allowances is explained on Note 1.2(d) of the Annual Report and Accounts 2017, and the Group's definitions for accounting purposes of 'past due', 'impaired' and 'renegotiated' are set out on pages 125, 126 and 113 respectively. The accounting definition of impaired and the

regulatory definition of default are generally aligned. In certain jurisdictions, for certain retail exposures, regulatory default is identified at 180 days past due, while the exposures are identified as impaired at 90 days past due. In the retail portfolio in the US, for accounting purposes, a renegotiation would normally trigger identification as 'impaired', whereas for regulatory purposes, default is identified mainly based on the 180 days past due criterion.

Under the accounting standards currently adopted by HSBC, impairment allowances, value adjustments and credit-related provisions for off-balance sheet amounts are treated as specific credit risk adjustments ('CRAs').

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Table 23: Amount of impaired exposures and related allowances, broken down by geographical region

| | Europe | Asia | MENA | North America | Latin America | Total |
|--|--------|-------|-------|---------------|---------------|-------|
| At 31 Dec 2017 | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Past due but not impaired exposures | 1.3 | 3.9 | 1.1 | 2.0 | 0.6 | 8.9 |
| – personal | 0.8 | 2.4 | 0.4 | 0.7 | 0.4 | 4.7 |
| – corporate and commercial | 0.5 | 1.2 | 0.6 | 1.1 | 0.2 | 3.6 |
| – financial | – | 0.3 | 0.1 | 0.2 | – | 0.6 |
| Impaired exposures | 8.1 | 2.3 | 2.1 | 2.6 | 0.7 | 15.8 |
| – personal | 2.0 | 0.7 | 0.4 | 1.6 | 0.3 | 5.0 |
| – corporate and commercial | 5.9 | 1.6 | 1.6 | 1.0 | 0.4 | 10.5 |
| – financial | 0.2 | – | 0.1 | – | – | 0.3 |
| Impairment allowances and other credit risk provisions | (3.2) | (1.6) | (1.8) | (0.9) | (0.6) | (8.1) |
| – personal | (0.6) | (0.3) | (0.4) | (0.2) | (0.3) | (1.8) |
| – corporate and commercial | (2.4) | (1.3) | (1.1) | (0.7) | (0.3) | (5.8) |
| – financial | (0.2) | – | (0.3) | – | – | (0.5) |
| At 31 Dec 2016 | | | | | | |
| Past due but not impaired exposures | 1.2 | 3.5 | 1.5 | 2.6 | 0.5 | 9.3 |
| – personal | 0.8 | 2.4 | 0.5 | 1.4 | 0.4 | 5.5 |
| – corporate and commercial | 0.4 | 1.1 | 0.9 | 0.8 | 0.1 | 3.3 |
| – financial | – | – | 0.1 | 0.4 | – | 0.5 |
| Impaired exposures | 8.2 | 2.6 | 2.4 | 5.9 | 0.6 | 19.7 |
| – personal | 2.0 | 0.6 | 0.5 | 4.2 | 0.3 | 7.6 |
| – corporate and commercial | 5.9 | 2.0 | 1.7 | 1.7 | 0.3 | 11.6 |
| – financial | 0.3 | – | 0.2 | – | – | 0.5 |
| Impairment allowances and other credit risk provisions | (2.9) | (1.6) | (1.9) | (1.7) | (0.5) | (8.6) |
| – personal | (0.5) | (0.3) | (0.6) | (0.6) | (0.3) | (2.3) |
| – corporate and commercial | (2.2) | (1.3) | (1.1) | (1.1) | (0.2) | (5.9) |
| – financial | (0.2) | – | (0.2) | – | – | (0.4) |

Table 24: Movement in specific credit risk adjustments by industry and geographical region

| | Europe | Asia | MENA | North America | Latin America | Total |
|---|--------|-------|-------|---------------|---------------|-------|
| Specific credit risk adjustments at 1 Jan 2017 | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Specific credit risk adjustments at 1 Jan 2017 | 2.9 | 1.6 | 1.9 | 1.7 | 0.5 | 8.6 |
| Amounts written off | (1.1) | (0.7) | (0.4) | (0.4) | (0.6) | (3.2) |
| – personal | (0.4) | (0.4) | (0.3) | (0.1) | (0.5) | (1.7) |
| – corporate and commercial | (0.6) | (0.3) | (0.1) | (0.3) | (0.1) | (1.4) |
| – financial | (0.1) | – | – | – | – | (0.1) |
| Recoveries of amounts written off in previous years | 0.3 | 0.1 | – | 0.1 | 0.1 | 0.6 |
| – personal | 0.3 | 0.1 | – | – | 0.1 | 0.5 |
| – corporate and commercial | – | – | – | 0.1 | – | 0.1 |
| – financial | – | – | – | – | – | – |
| Charge to income statement | 0.8 | 0.6 | 0.3 | (0.2) | (0.5) | 2.0 |
| – personal | 0.1 | 0.3 | 0.1 | – | 0.5 | 1.0 |
| – corporate and commercial | 0.6 | 0.3 | 0.2 | (0.2) | – | 0.9 |
| – financial | 0.1 | – | – | – | – | 0.1 |
| Exchange and other movements | 0.3 | – | – | (0.3) | (0.1) | 0.1 |

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| | | | | | | |
|---|-------|--------|--------|--------|--------|--------|
| Specific credit risk adjustments at 31 Dec 2017 | 3.2 | 1.6 | 1.8 | 0.9 | 0.6 | 8.1 |
| Specific credit risk adjustments at 1 Jan 2016 | 3.5 | 4.1 | 2.0 | 2.2 | 2.2 | 14.0 |
| Amounts written off | (1.1) |)(0.7) |)(0.3) |)(0.7) |)(0.6) |)(3.4) |
| – personal | (0.4) |)(0.4) |)(0.2) |)(0.3) |)(0.3) |)(1.6) |
| – corporate and commercial | (0.7) |)(0.3) |)(0.1) |)(0.4) |)(0.3) |)(1.8) |
| – financial | – | – | – | – | – | – |
| Recoveries of amounts written off in previous years | 0.2 | 0.1 | – | 0.1 | 0.1 | 0.5 |
| – personal | 0.2 | 0.1 | – | 0.1 | 0.1 | 0.5 |
| – corporate and commercial | – | – | – | – | – | – |
| – financial | – | – | – | – | – | – |
| Charge to income statement | 0.6 | 0.7 | 0.3 | 0.8 | 1.1 | 3.5 |
| – personal | 0.2 | 0.3 | 0.2 | 0.2 | 0.8 | 1.7 |
| – corporate and commercial | 0.4 | 0.4 | 0.1 | 0.6 | 0.3 | 1.8 |
| – financial | – | – | – | – | – | – |
| Exchange and other movements | (0.3) |)(2.6) |)(0.1) |)(0.7) |)(2.3) |)(6.0) |
| Specific credit risk adjustments at 31 Dec 2016 | 2.9 | 1.6 | 1.9 | 1.7 | 0.5 | 8.6 |

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Risk mitigation

Our approach when granting credit facilities is to do so on the basis of capacity to repay, rather than placing primary reliance on credit risk mitigants. Depending on a customer's standing and the type of product, facilities may be provided unsecured. Mitigation of credit risk is a key aspect of effective risk management and takes many forms. Our general policy is to promote the use of credit risk mitigation, justified by commercial prudence and capital efficiency. Specifically, detailed policies cover the acceptability, structuring and terms with regard to the availability of credit risk mitigation; for example in the form of collateral security. These policies, together with the setting of suitable valuation parameters, are subject to regular review to ensure that they are supported by empirical evidence and continue to fulfil their intended purpose.

Collateral

The most common method of mitigating credit risk is to take collateral. In our retail residential and commercial real estate ('CRE') businesses, a mortgage over the property is usually taken to help secure claims. Physical collateral is also taken in various forms of specialised lending and leasing transactions where income from the physical assets that are financed is also the principal source of facility repayment. In the commercial and industrial sectors, charges are created over business assets such as premises, stock and debtors. Loans to private banking clients may be made against a pledge of eligible marketable securities, cash or real estate. Facilities to SMEs are commonly granted against guarantees given by their owners and/or directors.

For credit risk mitigants comprising immovable property, the key determinant of concentration at Group level is geographic. Use of immovable property mitigants for risk management purposes is predominantly in Asia and Europe. Further information regarding collateral held over CRE and residential property is provided on pages 132 and 137, respectively, of the Annual Report and Accounts 2017.

Financial collateral

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

Further information regarding collateral held for trading exposures is on page 115.

In the non-trading book, we provide customers with working capital management products. Some of these products have loans and advances to customers, and customer accounts where we have rights of offset and comply with the regulatory requirements for on-balance sheet netting. Under on-balance sheet netting, the customer accounts are treated as cash collateral and the effects of this collateral are incorporated in our LGD estimates. For risk management purposes, the net amounts of such exposures are subject to limits and the relevant customer agreements are subject to review to ensure the legal right of offset remains appropriate. At 31 December 2017, \$33bn of customer accounts were treated as cash collateral, mainly in the UK.

Other forms of credit risk mitigation

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

is entered into directly with a central clearing house counterparty; otherwise our exposure to CDS protection providers is diversified among mainly banking counterparties with strong credit ratings. In our corporate lending, we also take guarantees from corporates and Export Credit Agencies ('ECA'). Corporates would normally provide guarantees as part of a parent/subsidiary or common parent relationship and would span a number of credit grades. The ECAs will normally be investment grade.

Policy and procedures

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

realisation of collateral security.

Valuing collateral

Valuation strategies are established to monitor collateral mitigants to ensure that they will continue to provide the anticipated secure secondary repayment source. Where collateral is subject to high volatility, valuation is frequent; where stable, less so. For market trading activities such as collateralised over-the-counter ('OTC') derivatives and SFTs, we typically carry out daily valuations. In the residential mortgage business, Group policy prescribes revaluation at intervals of up to three years, or more frequently as the need arises; for example, where market conditions are subject to significant change. Residential property collateral values are determined through a combination of professional appraisals, house price indices or statistical analysis.

Local market conditions determine the frequency of valuation for CRE. Revaluations are sought where, for example, material concerns arise in relation to the performance of the collateral. CRE revaluation also occurs commonly in circumstances where an obligor's credit quality has declined sufficiently to cause concern that the principal payment source may not fully meet the obligation.

Recognition of risk mitigation under the IRB approach

Within an IRB approach, risk mitigants are considered in two broad categories:

- those which reduce the intrinsic PD of an obligor and therefore operate as determinants of PD; and
- those which affect the estimated recoverability of obligations and require adjustment of LGD or, in certain limited circumstances, EAD.

The first category typically includes full parental guarantees – where one obligor within a group guarantees another. It is assumed that the guarantor's performance materially informs the PD of the guaranteed entity. PD estimates are also subject to a 'sovereign ceiling', constraining the risk ratings assigned to obligors in countries of higher risk, and where only partial parental support exists. In certain jurisdictions, certain types of third-party guarantee are recognised by substituting the obligor's PD with that of the guarantor.

In the second category, LGD estimates are affected by a wider range of collateral, including cash, charges over real estate property, fixed assets, trade goods, receivables and floating charges such as mortgage debentures. Unfunded mitigants, such as third-party guarantees, are also considered in LGD estimates where there is evidence that they reduce loss expectation.

The main types of provider of guarantees are banks, other financial institutions and corporates. The creditworthiness of providers of unfunded credit risk mitigation is taken into consideration as part of the guarantor's risk profile. Internal limits for such contingent exposure are approved in the same way as direct exposures.

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EAD and LGD values, in the case of individually assessed exposures, are determined by reference to regionally approved internal risk parameters based on the nature of the exposure. For retail portfolios, credit risk mitigation data is incorporated into the internal risk parameters for exposures and feeds into the calculation of the expected loss ('EL') band value summarising both customer delinquency and product or facility risk. Credit and credit risk mitigation data form inputs submitted by all Group offices to centralised databases. A range of collateral recognition approaches are applied to IRB capital treatments:

- unfunded protection, which includes credit derivatives and guarantees, is reflected through adjustment or determination of PD or LGD. Under the IRB advanced approach, recognition may be through PD or LGD; eligible financial collateral under the IRB advanced approach is recognised in LGD models. Under the IRB foundation approach, regulatory LGD values are adjusted. The adjustment to LGD is based on the degree to which the exposure value would be adjusted notionally if the financial collateral comprehensive method were applied; and
- for all other types of collateral, including real estate, the LGD for exposures calculated under the IRB advanced approach are calculated by models. For IRB foundation, base regulatory LGDs are adjusted depending on the value and type of the asset taken as collateral relative to the exposure. The types of eligible mitigant recognised under the IRB foundation approach are more limited.

Table 55 in Appendix I sets out, for IRB exposures, the exposure value and the effective value of credit risk mitigation expressed as the exposure value covered by the credit risk mitigant. IRB credit risk mitigation reductions of EAD were immaterial at 31 December 2017.

Recognition of risk mitigation under the standardised approach

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

Table 25: Credit risk mitigation techniques – overview¹

| | Exposures unsecured: carrying amount | Exposures secured: carrying amount | Exposures secured by collateral | Exposures secured by financial guarantees | Exposures secured by credit derivatives |
|---------------------------|---|---------------------------------------|---------------------------------------|--|--|
| | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1Loans | 657.7 | 574.8 | 478.9 | 93.8 | 2.1 |
| 2Debt securities | 301.0 | 24.1 | 18.7 | 5.4 | — |
| 3 Total at 31 Dec 2017 | 958.7 | 598.9 | 497.6 | 99.2 | 2.1 |
| 4 Of which: defaulted | 6.5 | 5.1 | 4.8 | 0.3 | — |
| 1Loans | 561.9 | 515.5 | 445.0 | 67.8 | 2.7 |
| 2Debt securities | 356.9 | 20.5 | 15.2 | 5.3 | — |
| 3 Total at 31 Dec 2016 | 918.8 | 536.0 | 460.2 | 73.1 | 2.7 |
| 4 Of which: defaulted | 9.3 | 4.8 | 4.7 | 0.1 | — |

1 The prior period comparison has been restated and presented in the EBA table format for consistency.

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Table 26: Standardised approach – credit conversion factor ('CCF') and credit risk mitigation ('CRM') effects

| | Exposures before CCF and CRM | | Exposures post-CCF and CRM | | RWAs and RWA density | |
|--|---------------------------------|-----------------------------|-------------------------------|-----------------------------|-------------------------|---------------------|
| | On-balance sheet amount | Off-balance sheet amount | On-balance sheet amount | Off-balance sheet amount | RWAs \$bn | RWA density % |
| | \$bn | \$bn | \$bn | \$bn | \$bn | % |
| Asset classes ¹ | | | | | | |
| 1 Central governments or central banks | 196.9 | 1.2 | 203.4 | 0.8 | 12.7 | 6 |
| 2 Regional governments or local authorities | 3.3 | 0.5 | 3.3 | 0.2 | 1.0 | 29 |
| 3 Public sector entities | 0.2 | 0.2 | 0.1 | — | 0.1 | 79 |
| 4 Multilateral development banks | 0.3 | — | 0.3 | — | — | 5 |
| 5 International organisations | 2.2 | — | 2.2 | — | — | — |
| 6 Institutions | 3.4 | 0.1 | 2.5 | — | 1.2 | 50 |
| 7 Corporates | 88.6 | 83.7 | 71.8 | 11.8 | 78.3 | 94 |
| 8 Retail | 23.8 | 46.8 | 21.9 | 0.3 | 16.5 | 74 |
| 9 Secured by mortgage on immovable property | 27.8 | 1.2 | 27.9 | 0.2 | 10.4 | 37 |
| 10 Exposures in default | 3.1 | 0.3 | 3.0 | 0.1 | 3.9 | 127 |
| 11 Higher-risk categories | 2.1 | 1.8 | 2.0 | 1.8 | 5.7 | 150 |
| 14 Collective investment undertakings | 0.6 | — | 0.5 | — | 0.6 | 100 |
| 15 Equity | 16.0 | — | 16.0 | — | 36.1 | 225 |
| 16 Other items | 11.1 | 0.8 | 11.2 | 0.8 | 6.4 | 54 |
| 17 Total at 31 Dec 2017 | 379.4 | 136.6 | 366.1 | 16.0 | 172.9 | 45 |
| 1 Central governments or central banks | 161.9 | 1.5 | 166.2 | 1.1 | 14.7 | 9 |
| 2 Regional governments or local authorities | 2.9 | 0.3 | 2.9 | — | 0.9 | 32 |
| 3 Public sector entities | — | — | — | — | — | — |
| 4 Multilateral development banks | 0.2 | — | 0.2 | — | — | 5 |
| 5 International organisations | 2.7 | — | 2.7 | — | — | — |
| 6 Institutions | 2.2 | — | 2.1 | — | 1.0 | 46 |
| 7 Corporates | 80.2 | 79.9 | 66.3 | 12.1 | 75.0 | 96 |
| 8 Retail | 22.7 | 44.2 | 21.6 | 0.4 | 16.3 | 74 |
| 9 Secured by mortgage on immovable property | 25.5 | 0.8 | 25.5 | 0.2 | 9.3 | 36 |
| 10 Exposures in default | 3.2 | 0.4 | 3.2 | 0.1 | 4.3 | 130 |
| 11 Higher-risk categories | 2.1 | 1.4 | 2.1 | 1.3 | 5.1 | 150 |
| 14 Collective investment undertakings | 0.5 | — | 0.5 | — | 0.5 | 100 |
| 15 Equity | 15.2 | — | 15.2 | — | 33.6 | 221 |
| 16 Other items | 9.5 | — | 9.5 | — | 4.7 | 50 |
| 17 Total at 31 Dec 2016 | 328.8 | 128.5 | 318.0 | 15.2 | 165.4 | 50 |

1 Securitisation positions are not included in this table.

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Table 27: Standardised approach – exposures by asset class and risk weight

| Risk weight ('RW%') | 0% | 2% | 20% | 35% | 50% | 70% | 75% | 100% | 150% | 250% | Deducted | Total credit exposure (post-CCF and CRM) | of which unrated |
|---|-------|------|------|------|------|------|------|------|------|------|----------|---|---------------------|
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Asset classes ¹ | | | | | | | | | | | | | |
| 1 Central governments or central banks | 198.9 | — | 0.1 | — | 0.2 | — | — | — | — | 5.0 | — | 204.2 | 5.0 |
| 2 Regional governments or local authorities | — | — | 2.6 | — | 0.7 | — | — | 0.2 | — | — | — | 3.5 | 0.6 |
| 3 Public sector entities | — | — | — | — | — | — | — | 0.1 | — | — | — | 0.1 | 0.1 |
| 4 Multilateral development banks | 0.2 | — | 0.1 | — | — | — | — | — | — | — | — | 0.3 | 0.3 |
| 5 International organisations | 2.2 | — | — | — | — | — | — | — | — | — | — | 2.2 | — |
| 6 Institutions | — | 0.1 | 0.4 | — | 1.7 | — | — | 0.3 | — | — | — | 2.5 | 0.3 |
| 7 Corporates | — | — | 3.8 | 0.2 | 3.9 | 0.5 | — | 74.5 | 0.7 | — | — | 83.6 | 72.4 |
| 8 Retail | — | — | — | — | — | — | 22.2 | — | — | — | — | 22.2 | 22.2 |
| 9 Secured by mortgage on immovable property | — | — | — | 27.3 | — | — | — | 0.8 | — | — | — | 28.1 | 28.1 |
| 10 Exposures in default | — | — | — | — | — | — | — | 1.5 | 1.6 | — | — | 3.1 | 3.1 |
| 11 Higher-risk categories | — | — | — | — | — | — | — | — | 3.8 | — | — | 3.8 | 3.8 |
| 14 Collective investment undertakings | — | — | — | — | — | — | — | 0.5 | — | — | — | 0.5 | 0.5 |
| 15 Equity | — | — | — | — | — | — | — | 2.6 | — | 13.4 | — | 16.0 | 16.0 |
| 16 Other items | 0.2 | — | 6.7 | — | — | — | — | 5.1 | — | — | — | 12.0 | 12.0 |
| 17 Total at 31 Dec 2017 | 201.5 | 0.1 | 13.7 | 27.5 | 6.5 | 0.5 | 22.2 | 85.6 | 6.1 | 18.4 | — | 382.1 | 164.4 |
| 1 Central governments or central banks | 160.4 | — | 0.8 | — | 0.3 | — | — | 0.2 | — | 5.6 | — | 167.3 | 5.7 |
| 2 Regional governments or local authorities | 0.2 | — | 1.8 | — | 0.7 | — | — | 0.2 | — | — | — | 2.9 | 0.3 |
| 3 Public sector entities | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 4 Multilateral development banks | 0.1 | — | 0.1 | — | — | — | — | — | — | — | — | 0.2 | 0.2 |
| 5 International organisations | 2.7 | — | — | — | — | — | — | — | — | — | — | 2.7 | — |
| 6 Institutions | — | 0.1 | 0.8 | — | 0.7 | — | — | 0.5 | — | — | — | 2.1 | 0.3 |
| 7 Corporates | — | — | 2.1 | 0.2 | 2.7 | 0.1 | — | 72.6 | 0.7 | — | — | 78.4 | 67.9 |
| 8 Retail | — | — | — | — | — | — | 22.0 | — | — | — | — | 22.0 | 22.0 |
| 9 Secured by mortgage on immovable property | — | — | — | 25.2 | — | — | — | 0.5 | — | — | — | 25.7 | 25.7 |
| 10 Exposures in default | — | — | — | — | — | — | — | 1.3 | 2.0 | — | — | 3.3 | 3.3 |
| 11 Higher-risk categories | — | — | — | — | — | — | — | — | 3.4 | — | — | 3.4 | 3.4 |
| 14 Collective investment undertakings | — | — | — | — | — | — | — | 0.5 | — | — | — | 0.5 | 0.5 |

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| | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|-----|-----|------|------|-----|------|---|-------|-------|
| 15 Equity | — | — | — | — | — | — | — | 2.9 | — | 12.3 | — | 15.2 | 15.2 |
| 16 Other items | 0.7 | — | 5.1 | — | — | — | — | 3.7 | — | — | — | 9.5 | 9.5 |
| 17 Total at 31 Dec 2016 | 164.1 | 10.1 | 10.7 | 25.4 | 4.4 | 0.1 | 22.0 | 82.4 | 6.1 | 17.9 | — | 333.2 | 154.0 |

1 Securitisation positions are not included in this table.

Table 28: IRB – Effect on RWA of credit derivatives used as CRM techniques

| | At 31 Dec | | 2016 | | Actual RWAs |
|---|-----------|--------------------------------|--------------------------------|----------------|----------------|
| | 2017 | Pre-credit derivatives RWAs | Pre-credit derivatives RWAs | Actual RWAs | |
| | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Exposures under FIRB | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 6 Corporates – other | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| 7 Exposures under AIRB ¹ | 181.3 | 180.1 | 159.7 | 158.6 | 158.6 |
| 8 Central governments and central banks | 5.2 | 5.2 | 5.9 | 5.9 | 5.9 |
| 9 Institutions | 4.8 | 4.8 | 2.7 | 2.7 | 2.7 |
| 11 Corporates – specialised lending | 19.0 | 19.0 | 14.4 | 14.4 | 14.4 |
| 12 Corporates – other | 122.5 | 121.3 | 105.2 | 104.1 | 104.1 |
| 14 Retail – Secured by real estate non-SMEs | 13.0 | 13.0 | 18.4 | 18.4 | 18.4 |
| 15 Retail – Qualifying revolving | 6.3 | 6.3 | 4.4 | 4.4 | 4.4 |
| 16 Retail – Other SMEs | 5.0 | 5.0 | 3.0 | 3.0 | 3.0 |
| 17 Retail – Other non-SMEs | 5.5 | 5.5 | 5.7 | 5.7 | 5.7 |
| 20 Total | 181.6 | 180.4 | 160.0 | 158.9 | 158.9 |

1 Securitisation positions are not included in this table.

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Table 29: Credit derivatives exposures

| | Footnote | At 31 Dec 2017 Protection bought \$bn | Protection sold \$bn | 2016 Protection bought \$bn | Protection sold \$bn |
|--|----------|---|----------------------------|--------------------------------------|----------------------------|
| Notionals | | | | | |
| Credit derivative products used for own credit portfolio | | | | | |
| – Index credit default swaps | | 6.3 | 3.7 | 4.6 | 1.9 |
| Total notionals used for own credit portfolio | | 6.3 | 3.7 | 4.6 | 1.9 |
| Credit derivative products used for intermediation | | | | | |
| | 1 | | | | |
| – Index credit default swaps | | 195.5 | 176.0 | 214.6 | 207.4 |
| – Total return swaps | | 7.8 | 12.2 | 12.3 | 7.0 |
| Total notionals used for intermediation | | 203.3 | 188.2 | 226.9 | 214.4 |
| Total credit derivative notionals | | 209.6 | 191.9 | 231.5 | 216.3 |
| Fair values | | | | | |
| – Positive fair value (asset) | | 0.8 | 4.3 | 2.3 | 2.9 |
| – Negative fair value (liability) | | (4.4 |)(1.0 |)(3.1 |)(2.7 |

¹ This is where we act as an intermediary for our clients, enabling them to take a position in the underlying securities.

¹ This does not increase risk for HSBC.

The above table shows the credit derivative exposures that HSBC holds, split between those amounts due to client intermediation and those amounts booked as part of HSBC's own credit portfolio. Where the credit derivative is used to hedge our own portfolio the resulting credit risk impact is seen in table 29 above and no counterparty credit risk capital requirement arises. For a discussion on hedging risk and monitoring the continuing effectiveness of hedges refer to Note 1.2(e) of the Annual Report and Accounts 2017.

Global risk

Application of the IRB approach

Our Group IRB credit risk rating framework incorporates obligor propensity to default expressed in PD, and loss severity in the event of default expressed in EAD and LGD. These measures are used to calculate regulatory EL and capital requirements. They are also used with other inputs to inform rating assessments for the purposes of credit approval and many other purposes, for example:

- credit approval and monitoring: IRB models are used in the assessment of customer and portfolio risk in lending decisions;

- risk appetite: IRB measures are an important element in identifying risk exposure at customer, sector and portfolio level;

- pricing: IRB parameters are used in pricing tools for new transactions and reviews; and

- economic capital and portfolio management: IRB parameters are used in the economic capital model that has been implemented across HSBC.

Roll-out of the IRB approach

With the PRA's permission, we have adopted the advanced approach for the majority of our business. At the end of 2017, portfolios in much of Europe, Asia and North America were on advanced IRB approaches. Others remain on the standardised or foundation approaches pending the development of models for the PRA's approval in line with our IRB roll-out plans where the primary focus is on corporate and retail exposures.

At 31 December 2017, 76% of the exposures were treated under AIRB, 3% under FIRB and 21% under the standardised approach.

EL and credit risk adjustments

We analyse credit loss experience in order to assess the performance of our risk measurement and control processes, and to inform our understanding of the implications for risk and capital management of dynamic changes occurring in the risk profile of our exposures.

When comparing EL with measures of credit losses under IFRSs, it is necessary to take into account differences in the definition and scope of each. Below are examples of matters that can give rise to material differences in the way economic, business and methodological drivers are reflected quantitatively in the accounting and regulatory measures of loss.

In 2018, IFRS 9 changes the way credit losses are measured for accounting purposes. IFRS 9 is conceptually more aligned with the IRB measurement of expected loss and uses similar building blocks such as PD and LGD and EL. Significant differences between regulatory and accounting measures of expected loss will continue under IFRS 9 due to factors such as: the removal of regulatory conservatism and supervisory set parameters under IFRS, point-in-time and forward-looking measurements under IFRS compared to through-the-cycle measures under regulatory, 12-month expected losses under regulatory versus lifetime expected losses under IFRS.

Table 52 in Appendix I set out for IRB credit exposures the EL, CRA balances and actual loss experience reflected in the charges for CRAs.

CRA balances represent management's best estimate of losses incurred in the loan portfolios at the balance sheet date. Charges for CRAs represent a movement in the CRA balance during the year, reflecting loss events that occurred during the financial year and changes in estimates of losses arising on events that occurred prior to the current year. EL represents the one-year regulatory expected loss accumulated in the book at the balance sheet date.

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Examples of differences in definition and scope between EL and CRA balances:

- Under IAS 39, our estimates of loss in impairment allowances are required to reflect the current circumstances and specific cash flow expectations of a customer. EL is based on modelled estimates and although the estimates may be individually assigned to specific exposures, the statistical nature of these models means that they are influenced by the behaviour of the overall portfolio.
 - EL is based on exposure values that incorporate expected future drawings of committed credit lines, while CRAs are recognised in respect of financial assets recognised on the balance sheet and in respect of committed credit lines where a loss is probable.
 - EL is generally based on through-the-cycle ('TTC') estimates of PD over a one-year future horizon, determined via statistical analysis of historical default experience. CRAs are recognised for losses that have been incurred at the balance sheet date.
 - In the majority of cases, EL is based on economic downturn estimates of LGD, while CRAs are measured using estimated future cash flows at the balance sheet date.
 - EL incorporates LGD, which may discount recoveries at a different rate from the effective interest rate employed in discounted cash flow analysis for CRAs.
 - LGDs typically include all costs associated with recovery, whereas the accounting measurement considers only the costs of obtaining and selling collateral.
 - In the foundation IRB approach, LGD and the conversion factors used to calculate EAD are set by regulations, and may differ significantly from the accounting assumptions about estimated cash flows.
 - For EL, certain exposures are subject to regulatory minimum thresholds for one or more parameters, whereas credit losses under IFRSs are determined using management's judgement about estimated future cash flows.
 - In the case of EL, to meet regulatory prudential standards, HSBC's model philosophy favours the incorporation of conservative estimation to accommodate uncertainty, for instance where modelling portfolios with limited data. Under IFRSs, uncertainty is considered when forming management's estimates of future cash flows, using balanced and neutral judgement.
- Qualitative disclosures on banks' use of external credit ratings under the standardised approach for credit risk
- 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 ('ECAIs') or ECAs to determine the risk weightings applied to rated counterparties.
- ECAI risk assessments are used within the Group as part of the determination of risk weightings for the following classes of exposure:
- central governments and central banks;
 - institutions;
 - corporates;
 - securitisation positions;
 - short-term claims on institutions and corporates;
 - regional governments and local authorities; and
 - multilateral development banks.

We have nominated three ECAIs for this purpose – Moody’s Investor Service (‘Moody’s’), Standard and Poor’s rating agency (‘S&P’) and Fitch Ratings (‘Fitch’). In addition to this, we use DBRS ratings specifically for securitisation positions. We have not nominated any ECAs.

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

When calculating the risk-weighted value of an exposure using ECAI risk assessments, risk systems identify the customer in question and look up the available ratings in the central database according to the rating selection rules. The systems then apply the prescribed credit quality step mapping to derive from the rating the relevant risk weight. All other exposure classes are assigned risk weightings as prescribed in the PRA’s Rulebook.

| Credit quality step | Moody’s assessment | S&P’s assessment | Fitch’s assessment | DBRS assessment |
|---------------------|--------------------|------------------|--------------------|-----------------|
| 1 | Aaa to Aa3 | AAA to AA– | AAA to AA– | AAA to AAL |
| 2 | A1 to A3 | A+ to A– | A+ to A– | AH to AL |
| 3 | Baa1 to Baa3 | BBB+ to BBB– | BBB+ to BBB– | BBBH to BBBL |
| 4 | Ba1 to Ba3 | BB+ to BB– | BB+ to BB– | BBH to BBL |
| 5 | B1 to B3 | B+ to B– | B+ to B– | BH to BL |
| 6 | Caa1 and below | CCC+ and below | CCC+ and below | CCCH and below |

Exposures to, or guaranteed by, central governments and central banks of European Economic Area (‘EEA’) states and denominated in local currency are risk-weighted at 0% using the standardised approach, provided they would be eligible under that approach for a 0% risk weighting.

Wholesale risk

The wholesale risk rating system

This section describes how we operate our credit risk analytical models and use IRB metrics in the wholesale customer business.

PDs for wholesale customer segments (that is central governments and central banks, financial institutions and corporate customers) and for certain individually assessed personal customers are derived from a customer risk rating (‘CRR’) master scale of 23 grades. Of these, 21 are non-default grades representing varying degrees of strength of financial condition, and two are default grades. Each CRR has a PD range associated with it as well as a mid-point PD.

The score generated by a credit risk rating model for the obligor is mapped to a corresponding PD and master-scale CRR. The CRR is then reviewed by a credit approver who, taking into account information such as the most recent events and market data, makes the final decision on the rating. The rating assigned reflects the approver’s overall view of the obligor’s credit standing.

The mid-point PD associated with the finally assigned CRR is then used in the regulatory capital calculation.

Relationship managers may propose a different CRR from that indicated through an override process which must be approved by the Credit function. Overrides for each model are recorded and monitored as part of the model management process.

The CRR is assigned at an obligor level, which means that separate exposures to the same obligor are generally subject to a single, consistent rating. Unfunded credit risk mitigants, such as guarantees, may also influence the final assignment of a CRR to an obligor. The effect of unfunded risk mitigants is considered for IRB approaches in table 55 and for the standardised approach in table 56.

If an obligor is in default on any material credit obligation to the Group, all of the obligor’s facilities from the Group are considered to be in default.

Under the IRB approach, obligors are grouped into grades that have similar PD or anticipated default frequency. The anticipated default frequency may be estimated using all relevant information at the relevant date (PIT rating system) or be free of the effects of the credit cycle (TTC rating system).

We generally utilise a hybrid approach of PIT and TTC. That is, while models are calibrated to long-run default rates, obligor ratings are reviewed annually, or more frequently if necessary, to reflect changes in their circumstances and/or their economic operating environment.

Our policy requires approvers to downgrade ratings on expectations, but to upgrade them only on performance. This leads to expected defaults typically exceeding actual defaults.

For EAD and LGD estimation, operating entities are permitted, subject to overview by Group Risk, to use their own modelling approaches to suit conditions in their jurisdictions. Group Risk provides co-ordination, benchmarks, and promotion of best practice on EAD and LGD estimation.

EAD is estimated to a 12-month forward time horizon and represents the current exposure, plus an estimate for future increases in exposure and the realisation of contingent exposures post-default.

LGD is based on the effects of facility and collateral structure on outcomes post-default. This includes such factors as the type of client, the facility seniority, the type and value of collateral, past recovery experience and priority under law. It is expressed as a percentage of EAD.

Wholesale models

To determine credit ratings for the different types of wholesale obligor, multiple models and scorecards are used for PD, LGD, and EAD. These models may be differentiated by region, customer segment and/or customer size. For example, PD models are differentiated for all of our key customer segments, including sovereigns, financial institutions, and large-, medium- and small-sized corporates.

Global PD models have been developed for asset classes or clearly identifiable segments of asset classes where the customer relationship is managed globally; for example, sovereigns, financial institutions and the largest corporate clients that typically operate internationally.

Local PD models, specific to a particular country, region, or sector, are developed for other obligors. This includes corporate clients when they show distinct characteristics in common in a particular geography.

The two major drivers of model methodology are the nature of the portfolio and the availability of internal or external data on historical defaults and risk factors. For some historically low-default portfolios, e.g. sovereign and financial institutions, a model will rely more heavily on external data and/or the input of an expert panel. Where sufficient data is available, models are built on a statistical basis, although the input of expert judgement may still form an important part of the overall model development methodology.

Most LGD and EAD models are developed according to local circumstances, considering legal and procedural differences in the recovery and workout processes. Our approach to EAD and LGD also encompasses global models for central governments and central banks, and for institutions, as exposures to these customer types are managed centrally by Global Risk. The PRA requires all firms to apply an LGD floor of 45% for senior unsecured exposure to sovereign entities. This floor was applied to reflect the relatively few loss observations across all firms in relation to these obligors. This floor is applied for the purposes of regulatory capital reporting.

The PRA has published guidance on the appropriateness of LGD models for low default portfolios. It states there should be at least 20 defaults per country per collateral type for LGD models to be approved. Where there are insufficient defaults, an LGD floor will be applied. As a result, in 2017, we continued to apply LGD floors for our banks portfolio and some Asian corporate portfolios where there were insufficient loss observations.

In the same guidance, the PRA also indicated that it considered income-producing real estate to be an asset class that would be difficult to model. As a result, RWAs for our UK CRE portfolio and US income-producing CRE portfolio are calculated using the supervisory slotting approach. Under the supervisory slotting approach the bank allocates exposures to one of five categories. Each category then fixed pre-determined RWA and EL percentages.

Local models for the corporate exposure class are developed using various data inputs, including collateral information and geography (for LGD) and product type (for EAD). The most material corporate models are the UK and Asia models, all of which are developed using more than 10-years' worth of data. The LGD models are calibrated to a period of credit stress or downturn in economic conditions.

None of the EAD models are calibrated for a downturn, as analysis shows that utilisation decreases during a downturn because credit stress is accompanied by more intensive limit monitoring and facility reduction.

Table 30 sets out the key characteristics of the significant wholesale credit risk models that drive the capital calculation split by regulatory wholesale asset class, with their associated RWAs, including the number of models for each component, the model method or approach and the number of years of loss data used.

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Table 30: Wholesale IRB credit risk models

| Regulatory asset classes measured | RWAs for associated asset class \$bn | Component | Number of significant models | Model description and methodology | Number of years loss data | Regulatory Floors |
|---------------------------------------|--------------------------------------|-----------|------------------------------|--|---------------------------|---|
| Central governments and central banks | 33.9 | 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% |
| | | 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 |
| | | PD | 1 | A statistical model that combines quantitative analysis on financial information with expert inputs and macroeconomic factors. | 10 | PD >0.03% |
| Institutions | 17.7 | 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% |
| | | EAD | 1 | A quantitative model that assigns credit conversion factors ('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 |
| Corporates ¹ | 342.9 | | | | | |
| Global large corporates | | PD | 1 | A statistical model built on 15 years of data. The model uses financial information, macroeconomic information and market-driven data, and is complemented by a qualitative assessment. Corporates that fall below the global large corporate threshold are rated through regional/local PD models, which reflect regional/local circumstances. These models use financial information, behavioural data and qualitative information to derive a statistically built PD. | 15 | PD >0.03% |
| Other regional / local corporates | | PD | 11 | | >10 | |
| | | PD | 10 | | 10 | PD >0.03% |

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| | | | | | |
|---------------------------------|-----|---|---|----|---|
| Non-bank financial institutions | | | Predominantly statistical models that combines quantitative analysis on financial information with expert inputs. | | |
| All corporates | LGD | 7 | Regional/local statistical models covering all corporates, including global large corporates, developed using historical loss/recovery data and various data inputs, including collateral information, customer type and geography. | >7 | UK 45% |
| | EAD | 5 | Regional/local statistical models covering all corporates, including global large corporates, developed using historical utilisation information and various data inputs, including product type and geography. | >7 | EAD must be at least equal to the current utilisation of the balance at account level |

1 Excludes specialised lending exposures subject to supervisory slotting approach (see table 61).

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Table 31: IRB models – estimated and actual values (wholesale)¹

| | Footnotes | PD ² | | LGD ³ | | EAD ⁴ | |
|----------------------------------|-----------|-----------------|--------------|-----------------------------|---------------------------|------------------|--------------|
| | | Estimated % | Actuals % | Estimated ⁵ % | Actuals ⁵ % | Estimated % | Actuals % |
| 2017 | | | | | | | |
| – Sovereigns model ⁶ | | 2.24 | — | — | — | — | — |
| – Banks model | | 1.72 | — | — | — | — | — |
| – Corporates models ⁷ | | 1.72 | 0.96 | 27.75 | 25.45 | 0.39 | 0.36 |
| 2016 | | | | | | | |
| – Sovereigns model ⁶ | | 3.43 | — | — | — | — | — |
| – Banks model | | 1.63 | — | — | — | — | — |
| – Corporates models ⁷ | | 1.79 | 1.23 | 37.71 | 29.43 | 0.91 | 0.76 |
| 2015 | | | | | | | |
| – Sovereigns model ⁶ | | 1.72 | 1.12 | 45.00 | — | 0.07 | — |
| – Banks model | | 2.22 | — | — | — | — | — |
| – Corporates models ⁷ | | 1.89 | 1.26 | 37.74 | 21.52 | 0.60 | 0.55 |
| 2014 | | | | | | | |
| – Sovereigns model ⁶ | | 2.27 | — | — | — | — | — |
| – Banks model | | 3.28 | — | — | — | — | — |
| – Corporates models ⁷ | | 1.88 | 1.16 | 36.83 | 16.06 | 0.47 | 0.34 |
| 2013 | | | | | | | |
| – Sovereigns model ⁶ | | 4.14 | — | — | — | — | — |
| – Banks model | | 3.18 | 0.20 | 40.01 | — | 0.06 | 0.04 |
| – Corporates models ⁷ | | 2.63 | 1.20 | 33.09 | 18.69 | 0.54 | 0.48 |

¹Data represents an annual view, analysed at 30 September.

²Estimated PD for all models is average PD calculated on the number of obligors covered by the model(s).

³Estimated and actual LGD represent defaulted populations. Average LGD values are EAD-weighted.

⁴Expressed as a percentage of total EAD, which includes all defaulted and non-defaulted exposures for the relevant population.

For sovereigns and banks models, estimated and actual LGD represents the average LGD for customers that defaulted in the year. For corporates models, they represent the average LGD for customers that have defaulted and been resolved in the period.

⁶For 2017, 2016, 2015 and 2014, the estimated PD excludes inactive sovereign obligors.

Covers the combined populations of the global large corporates model, all regional IRB models for large, medium

and small corporates, and non-bank financial institutions. For 2017, 2016, 2015 and 2014, the estimated and observed PDs were calculated only for unique obligors.

Table 32: IRB models – corporate PD models – performance by CRR grade

| Actual PD ⁵ | Footnotes | Corporates ¹ | | Estimated PD ⁴ | Actual PD ⁵ | Diff. in PD |
|------------------------|-----------|-------------------------|------------------------|---------------------------|------------------------|-------------|
| | | Facility ² | Defaulted ³ | | | |
| | | % | % | % | % | % |
| 2017 | | | | | | |
| CRR 0.1 | 6 | — | — | 0.01 | — | 0.00 |
| CRR 1.1 | | 2.84 | — | 0.02 | — | 0.02 |
| CRR 1.2 | | 5.98 | — | 0.04 | — | 0.04 |
| CRR 2.1 | | 17.92 | — | 0.07 | — | 0.07 |

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| | | | | | | |
|---------|--------|-------|-------|-------|-------|---|
| CRR 2.2 | 13.84 | 0.02 | 0.13 | 0.03 | 0.10 | |
| CRR 3.1 | 11.53 | 0.01 | 0.22 | 0.07 | 0.15 | |
| CRR 3.2 | 10.51 | 0.02 | 0.37 | 0.14 | 0.23 | |
| CRR 3.3 | 10.78 | 0.12 | 0.63 | 0.25 | 0.38 | |
| CRR 4.1 | 7.05 | 0.15 | 0.87 | 0.36 | 0.51 | |
| CRR 4.2 | 5.35 | 0.27 | 1.20 | 0.40 | 0.80 | |
| CRR 4.3 | 4.89 | 0.14 | 1.65 | 0.58 | 1.07 | |
| CRR 5.1 | 3.58 | 0.77 | 2.25 | 1.39 | 0.86 | |
| CRR 5.2 | 1.93 | 1.25 | 3.05 | 1.61 | 1.44 | |
| CRR 5.3 | 1.58 | 2.56 | 4.20 | 2.28 | 1.92 | |
| CRR 6.1 | 1.21 | 4.95 | 5.75 | 4.47 | 1.28 | |
| CRR 6.2 | 0.36 | 4.43 | 7.85 | 7.88 | (0.03 |) |
| CRR 7.1 | 0.27 | 8.32 | 10.00 | 10.47 | (0.47 |) |
| CRR 7.2 | 0.09 | 11.95 | 13.00 | 10.10 | 2.90 | |
| CRR 8.1 | 0.22 | 14.07 | 19.00 | 10.88 | 8.12 | |
| CRR 8.2 | 0.04 | 32.01 | 36.00 | 15.88 | 20.12 | |
| CRR 8.3 | 0.03 | 33.10 | 75.00 | 17.89 | 57.11 | |
| Total | 100.00 | | | | | |

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Table 32: IRB models – corporate PD models – performance by CRR grade
(continued)

| | Corporates ¹ | | | | | Diff. in PD % |
|-----------|-------------------------|----------------------------|-----------------------------|--------------------------------|-----------------------------|---------------------|
| | Footnotes | Facility ² % | Defaulted ³ % | Estimated PD ⁴ % | Actual PD ⁵ % | |
| 2016 | | | | | | |
| CRR 0.1 6 | — | — | 0.01 | — | 0.01 | |
| CRR 1.1 | 3.88 | — | 0.02 | — | 0.02 | |
| CRR 1.2 | 6.05 | — | 0.04 | — | 0.04 | |
| CRR 2.1 | 17.51 | — | 0.07 | — | 0.07 | |
| CRR 2.2 | 15.05 | 0.01 | 0.13 | 0.03 | 0.10 | |
| CRR 3.1 | 11.22 | 1.03 | 0.22 | 0.25 | (0.03) | |
| CRR 3.2 | 10.67 | 0.26 | 0.37 | 0.36 | 0.01 | |
| CRR 3.3 | 9.21 | 0.26 | 0.63 | 0.49 | 0.14 | |
| CRR 4.1 | 6.46 | 0.78 | 0.87 | 0.79 | 0.08 | |
| CRR 4.2 | 5.49 | 0.47 | 1.20 | 0.64 | 0.56 | |
| CRR 4.3 | 4.59 | 1.18 | 1.65 | 1.46 | 0.19 | |
| CRR 5.1 | 4.08 | 1.31 | 2.25 | 1.41 | 0.84 | |
| CRR 5.2 | 2.11 | 1.40 | 3.05 | 1.89 | 1.16 | |
| CRR 5.3 | 1.76 | 1.96 | 4.20 | 2.27 | 1.93 | |
| CRR 6.1 | 0.98 | 10.15 | 5.75 | 5.57 | 0.18 | |
| CRR 6.2 | 0.38 | 15.38 | 7.85 | 4.68 | 3.17 | |
| CRR 7.1 | 0.27 | 14.29 | 10.00 | 9.46 | 0.54 | |
| CRR 7.2 | 0.09 | 12.38 | 13.00 | 6.63 | 6.37 | |
| CRR 8.1 | 0.10 | 48.22 | 19.00 | 13.11 | 5.89 | |
| CRR 8.2 | 0.07 | 47.10 | 36.00 | 20.29 | 15.71 | |
| CRR 8.3 | 0.03 | 36.10 | 75.00 | 17.83 | 57.17 | |
| Total | | 100.00 | | | | |
| 2015 | | | | | | |
| CRR 0.1 6 | — | — | 0.01 | — | 0.01 | |
| CRR 1.1 | 5.72 | — | 0.02 | — | 0.02 | |
| CRR 1.2 | 5.25 | — | 0.04 | — | 0.04 | |
| CRR 2.1 | 16.48 | — | 0.07 | — | 0.07 | |
| CRR 2.2 | 14.17 | — | 0.13 | 0.01 | 0.12 | |
| CRR 3.1 | 11.92 | 0.17 | 0.22 | 0.15 | 0.07 | |
| CRR 3.2 | 11.00 | 0.10 | 0.37 | 0.30 | 0.07 | |
| CRR 3.3 | 9.35 | 0.14 | 0.63 | 0.47 | 0.16 | |
| CRR 4.1 | 6.52 | 0.64 | 0.87 | 0.97 | (0.10) | |
| CRR 4.2 | 5.07 | 0.45 | 1.20 | 1.06 | 0.14 | |
| CRR 4.3 | 4.38 | 0.62 | 1.65 | 1.55 | 0.10 | |
| CRR 5.1 | 3.52 | 0.99 | 2.25 | 1.24 | 1.01 | |
| CRR 5.2 | 2.19 | 0.61 | 3.05 | 1.44 | 1.61 | |
| CRR 5.3 | 2.24 | 1.74 | 4.20 | 1.89 | 2.31 | |
| CRR 6.1 | 0.89 | 4.66 | 5.75 | 5.05 | 0.70 | |
| CRR 6.2 | 0.66 | 3.58 | 7.85 | 6.46 | 1.39 | |
| CRR 7.1 | 0.31 | 10.79 | 10.00 | 7.13 | 2.87 | |

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| | | | | | |
|---------|-------|-------|-------|-------|-------|
| CRR 7.2 | 0.09 | 7.27 | 13.00 | 9.48 | 3.52 |
| CRR 8.1 | 0.14 | 11.33 | 19.00 | 11.11 | 7.89 |
| CRR 8.2 | 0.07 | 16.97 | 36.00 | 23.61 | 12.39 |
| CRR 8.3 | 0.03 | 16.66 | 75.00 | 17.10 | 57.90 |
| Total | 100.0 | | | | |

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Table 32: IRB models – corporate PD models – performance by CRR grade
(continued)

| | Corporates ¹ | | | | | |
|-----------|-------------------------|----------------------------|-----------------------------|--------------------------------|-----------------------------|---------------------|
| | Footnote | Facility ² % | Defaulted ³ % | Estimated PD ⁴ % | Actual PD ⁵ % | Diff. in PD % |
| 2014 | | | | | | |
| CRR 0.1 6 | | 0.01 | — | 0.01 | — | 0.01 |
| CRR 1.1 | | 6.32 | — | 0.02 | — | 0.02 |
| CRR 1.2 | | 6.68 | — | 0.04 | — | 0.04 |
| CRR 2.1 | | 16.71 | 0.01 | 0.07 | 0.04 | 0.03 |
| CRR 2.2 | | 13.07 | — | 0.13 | — | 0.13 |
| CRR 3.1 | | 10.38 | 0.06 | 0.22 | 0.10 | 0.12 |
| CRR 3.2 | | 12.50 | 0.11 | 0.37 | 0.23 | 0.14 |
| CRR 3.3 | | 6.62 | 0.25 | 0.63 | 0.54 | 0.09 |
| CRR 4.1 | | 10.41 | 0.28 | 0.87 | 0.54 | 0.33 |
| CRR 4.2 | | 4.12 | 0.79 | 1.20 | 0.81 | 0.39 |
| CRR 4.3 | | 3.49 | 0.83 | 1.65 | 0.91 | 0.74 |
| CRR 5.1 | | 2.50 | 0.53 | 2.25 | 0.97 | 1.28 |
| CRR 5.2 | | 2.09 | 0.54 | 3.05 | 1.24 | 1.81 |
| CRR 5.3 | | 1.47 | 1.74 | 4.20 | 2.70 | 1.50 |
| CRR 6.1 | | 0.59 | 3.02 | 5.75 | 4.11 | 1.64 |
| CRR 6.2 | | 0.30 | 1.12 | 7.85 | 4.27 | 3.58 |
| CRR 7.1 | | 0.29 | 14.59 | 10.00 | 11.35 | (1.35) |
| CRR 7.2 | | 0.08 | 2.78 | 13.00 | 10.11 | 2.89 |
| CRR 8.1 | | 2.31 | 1.17 | 19.00 | 13.77 | 5.23 |
| CRR 8.2 | | 0.04 | 32.32 | 36.00 | 22.33 | 13.67 |
| CRR 8.3 | | 0.02 | 4.85 | 75.00 | 14.89 | 60.11 |
| Total | | 100.0 | | | | |
| 2013 | | | | | | |
| CRR 0.1 6 | | — | — | 0.01 | — | 0.01 |
| CRR 1.1 | | 4.83 | — | 0.02 | — | 0.02 |
| CRR 1.2 | | 7.47 | — | 0.04 | — | 0.04 |
| CRR 2.1 | | 20.85 | — | 0.07 | — | 0.07 |
| CRR 2.2 | | 10.38 | 0.01 | 0.13 | 0.03 | 0.10 |
| CRR 3.1 | | 10.79 | 0.07 | 0.22 | 0.16 | 0.06 |
| CRR 3.2 | | 9.49 | 0.13 | 0.37 | 0.22 | 0.15 |
| CRR 3.3 | | 8.33 | 0.15 | 0.63 | 0.27 | 0.36 |
| CRR 4.1 | | 6.40 | 0.35 | 0.87 | 0.48 | 0.39 |
| CRR 4.2 | | 5.84 | 0.93 | 1.20 | 0.80 | 0.40 |
| CRR 4.3 | | 4.22 | 0.47 | 1.65 | 0.67 | 0.98 |
| CRR 5.1 | | 4.18 | 0.72 | 2.25 | 0.76 | 1.49 |
| CRR 5.2 | | 3.07 | 0.97 | 3.05 | 1.03 | 2.02 |
| CRR 5.3 | | 1.85 | 2.77 | 4.20 | 1.89 | 2.31 |
| CRR 6.1 | | 0.98 | 4.37 | 5.75 | 3.28 | 2.47 |
| CRR 6.2 | | 0.46 | 5.74 | 7.85 | 3.77 | 4.08 |
| CRR 7.1 | | 0.44 | 12.69 | 10.00 | 7.95 | 2.05 |
| CRR 7.2 | | 0.15 | 7.84 | 13.00 | 8.68 | 4.32 |
| CRR 8.1 | | 0.15 | 9.48 | 19.00 | 11.44 | 7.56 |

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| | | | | | |
|---------|-------|-------|-------|-------|-------|
| CRR 8.2 | 0.07 | 14.94 | 36.00 | 13.70 | 22.30 |
| CRR 8.3 | 0.05 | 13.12 | 75.00 | 13.64 | 61.36 |
| Total | 100.0 | | | | |

¹ Covers the combined populations of the global large corporates model, all regional IRB models for large, medium and small corporates and non-bank financial institutions.

² Total facility limits for each CRR grade, expressed as a percentage of total limits granted.

³ Defaulted facilities as a percentage of total facility limits at that grade.

⁴ The estimated PD is before application of the 0.03% regulatory floor.

⁵ Actual PD is based on the number of defaulted obligors covered by the model(s), without taking into account the size of the facility granted or the exposures to the obligor.

⁶ The top band of the wholesale CRR master scale is not available to entities in the corporates exposure class. It is restricted to the strongest central governments, central banks and institutions.

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Retail risk

Retail risk rating systems

Due to the different country-level portfolio performance characteristics and loss history, there are no global models for our retail portfolios. Across the Group, over 100 models are used with the PRA's approval under our IRB permission. The 10 most material risk rating systems for which we disclose details of modelling methodology and performance data represent RWAs of \$38bn or 58% of the total retail IRB RWA.

In previous years, the most material rating systems have included our US Consumer Lending and Mortgage Services portfolios. These have now been sold. We continue to disclose the 10 most material portfolios, which includes additional mortgage portfolios in the UK and Hong Kong.

PD models are developed using statistical estimation based on a minimum of five years of historical data. The modelling approach

is typically inherently TTC or, where models are developed based on a PIT approach (as in the UK), the model outputs become effectively TTC through the application of buffer or model adjustments as agreed with the PRA.

EAD models are also developed using at least five years of historical observations and typically adopt one of two approaches:

- for closed-end products without the facility for additional drawdowns, EAD is estimated as the outstanding balance of accounts at the time of observation; or

- for products with the facility for additional drawdowns, EAD 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.

Table 33: Material retail IRB risk rating systems

| Portfolio | CRD IV asset class | RWA \$bn | Component model | Number of material component models | Model description and methodology | Number of years loss data ¹ | Applicable Pillar 1 regulatory thresholds and overlays |
|-------------------------------|---|----------|-----------------|-------------------------------------|--|--|--|
| UK HSBC residential mortgages | Retail – secured by mortgages on immovable property non-SME | 4.60 | PD | 1 | Statistical model built on internal behavioural data and bureau information. Underlying PIT model is calibrated to the latest observed PD. An adjustment is then applied to generate the long-run PD based on a combination of historical misalignment of the underlying model and expert judgement. Statistical estimates of loss and probability of possession in combination with the workout process and using the 1990s recession in benchmarking the downturn LGD. | 7–10 | PD floor of 0.03% |
| | | | LGD | 1 | | >10 | LGD floor of 10% at portfolio level |
| | | | EAD | 1 | | 7–10 | EAD must at least be equal to current balance |
| | | 0.96 | PD | 1 | | 7–10 | |

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| | | | | | | | |
|------------------------|---|------|---|------|--|--|---|
| UK First Direct | Retail – secured by residential mortgages on mortgages immovable property non-SME | | | | Underlying PIT PD model is a segmented scorecard. An adjustment is then applied based on observed misalignment in the underlying model (with some additional conservatism applied). Underlying model is component based (LGD, forced sale haircut and the time between default and property sale). A downturn adjustment is applied through a 30% drop from peak house price plus adjustments to the other components in the model, including a 10% forced sale haircut. | | PD floor of 0.03% |
| | | LGD | 1 | >10 | | | LGD floor of 10% at portfolio level |
| | | EAD | 2 | 7–10 | There are two separate EAD models – one for standard capital repayment mortgages and one for offset mortgages which offer a revolving loan facility. | | EAD must at least be equal to current balance |
| | | PD | 1 | 7–10 | Statistical model built on internal behavioural data and bureau information. Underlying PIT model is calibrated to the latest observed PD. An adjustment is then applied to generate the long run PD based on historical observed misalignment of the underlying model. | | PD floor of 0.03% |
| UK HSBC credit cards | Retail – qualifying revolving | 2.26 | | | Statistical model based on forecasting the amount of expected future recoveries, segmented by default status. | | |
| | | LGD | 1 | 7–10 | | | |
| | | EAD | 1 | 7–10 | Statistical model that directly estimates EAD for different segments of the portfolio using either balance or limit as the key input. | | EAD must at least be equal to current balance |
| UK HSBC personal loans | Retail – other non-SME | 3.87 | | | Statistical model built on internal behavioural data and bureau information. Underlying PIT model is calibrated to the latest observed PD. An adjustment is then applied to generate the long run PD based on historical observed misalignment of the underlying model. | | |
| | | PD | 1 | 7–10 | | | PD floor of 0.03% |
| | | LGD | 1 | 7–10 | Statistical model based on forecasting the amount of expected future recoveries, segmented by default status. | | |
| | | EAD | 1 | 7–10 | EAD is equal to current balance as this provides a conservative | | EAD must at least be equal |

estimate.

to current
balance

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Table 33: Material retail IRB risk rating systems (continued)

| Portfolio | CRD IV asset class | RWA \$bn | Component model | Number of material component models | Model description and methodology | Number of years loss data | Applicable Pillar 1 regulatory thresholds and overlays |
|--|---|----------|-----------------|-------------------------------------|---|---------------------------|--|
| UK business banking | Retail – other SME | 3.04 | PD | 1 | Statistical model built on internal behavioural data and bureau information. Underlying PIT model is calibrated to the latest observed PD. An adjustment is then applied to generate the long run PD based on historical observed misalignment of the underlying model. | 7–10 | PD floor of 0.03% |
| | | | LGD | 2 | Two sets of models – one for secured exposures and another for unsecured exposures. The secured model uses the value to loan as a key component for estimation and the unsecured model estimates the amount of future recoveries and undrawn portion. | 7–10 | |
| | | | EAD | 1 | Statistical model using segmentation according to limit and utilisation and estimation of the undrawn exposure. | 7–10 | EAD must at least be equal to current balance |
| | | | PD | 2 | Statistical model built on internal behavioural data and bureau information, and calibrated to a long-run default rate. | >10 | PD floor of 0.03% |
| Hong Kong HSBC personal residential mortgages ² | Retail – secured by mortgages on immovable property non-SME | 8.20 | LGD | 2 | Statistical model 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 | 2 | Rule-based calculation based on current balance which provides a conservative estimate of EAD. | >10 | EAD must at least be equal to current balance |
| Hong Kong Hang Seng personal residential mortgages | Retail – secured by mortgages on immovable property non-SME | 4.54 | PD | 2 | Statistical model built on internal behavioural data, and calibrated to a long-run default rate. | >10 | PD floor of 0.03% |
| | | | LGD | 2 | Two statistical models and one historical average model based | >10 | LGD floor of 10% at |

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on estimates of loss incurred over a recovery period derived from historical data with a downturn adjustment.

portfolio level

EAD 2 Rule-based calculation based on current balance which provides a conservative estimate of EAD. >10 EAD must at least be equal to current balance

PD 1 Statistical model built on internal behavioural data and bureau information, and calibrated to a long-run default rate. >10 PD floor of 0.03%

Statistical model based on forecasting the amount of expected losses. Downturn LGD derived using data from the period with the highest default rate. >10

EAD 1 Statistical model which derives a credit utilisation which is used to estimate EAD. >10 EAD must at least be equal to current balance

PD 1 Statistical model built on internal behavioural data and bureau information, and calibrated to a long-run default rate. >10 PD floor of 0.03%

Statistical model based on forecasting the amount of expected future losses. Downturn LGD derived using data from the period with the highest default rate. >10

EAD 1 Statistical model which derives a credit conversion factor to determine the proportion of undrawn limit to be added to the balance at observation. >10 EAD must at least be equal to current balance

PD 1 Statistical model built on internal behavioural data and bureau information, and calibrated to a long-run default rate. >10 PD floor of 0.03%

LGD 1 Statistical model based on identifying the main risk drivers of loss and recovery and grouping them into homogeneous pools. Downturn LGD is derived based on the peak default rate observed. >10 LGD floor of 10% at portfolio level

Hong Kong HSBC credit cards Retail – qualifying revolving

3.50

LGD 1

Hong Kong HSBC personal instalment loans Retail – other non-SME

1.50

LGD 1

US HSBC Mortgage Corporation first lien³ Retail – secured by mortgages on immovable property non-SME

5.41

LGD 1

Additional assumptions and estimations are made on incomplete workouts.

EAD 1

Rule-based calculation based on current balance which provides >10 a conservative estimate of EAD.

EAD must at least be equal to current balance

¹ Defined as the number of years of historical data used in model development and estimation.

² In 2017, the Hong Kong Monetary Authority ('HKMA') increased the risk weight floor from 15% to 25% for all residential mortgages booked after 19 May 2017.

³ In US mortgage business, first lien is a primary claim on a property that takes precedence over all subsequent claims and will be paid first from the proceeds in case of the property's foreclosure sale.

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Retail credit models

Given the large number of retail IRB models globally, we disclose information on our most material local models. The actual and estimated values are derived from the model monitoring and calibration processes performed at a local level. Within the discipline of our global modelling policies, our analytics teams adopt back-testing criteria specific to local conditions in order to assess the accuracy of their models.

Table 34 contains the estimated and actual values from the back-testing of our material IRB models covering portfolios in the UK, Hong Kong and the residential mortgage portfolio in the US. The most recent three years have been included for the portfolios added to this year's disclosures.

Within table 34, for back-testing purposes, a customer's PD is observed at a PIT and their default or non-default status in the following one-year period is recorded against that PD grade. The PD presented here is expressed on an obligor count basis consisting of non-defaulted obligors at the time of observation. The LGD and EAD refer to observations for the defaulted population, being the appropriate focus of an assessment of these models' performance. The LGD values represent the amount of loss as a percentage of EAD, and are calculated based on defaulted accounts that were fully resolved or have completed the modelled recovery outcome period at the reporting date. The EAD values of the defaulted exposures are presented as a percentage of the total EAD, which includes all defaulted and non-defaulted exposures for the relevant population. The regulatory PD and LGD floors of 0.03% and 10%, respectively, are applied during final capital calculation and are not reflected in the estimates below.

For our UK residential mortgage portfolios, the model outputs include required regulatory downturn adjustments. In conducting the back-testing, our UK residential mortgage LGD models consider repossession rates over a 36 month period starting at the date of default. For both our HSBC and First Direct branded residential mortgages, LGD estimates and actual LGD values remained low and stable in 2017.

The Hong Kong estimated LGD values in table 34 include required stressed factors to reflect downturn conditions. The LGD models for our Hong Kong HSBC and Hang Seng residential mortgage portfolios use a recovery outcome period of 24 months starting at the date of default. For both portfolios, LGD estimates remain higher than the calculated actual values but below the 10% regulatory floor. The Hong Kong credit card EAD model currently underestimates exposure values at the point of default; however, this is mitigated by a temporary adjustment to RWAs. An updated model has been submitted to the PRA for approval following approval from the local regulator and is expected to be implemented during 2018. Actual LGD values for Hong Kong personal loans have increased in 2017 due to the inclusion of restructured loans in the calculation. This provides a more accurate assessment of losses. LGD estimates remain higher than the actual values.

The US estimates in table 34 include downturn adjustments and model overlays agreed with the PRA. The LGD models use a recovery outcome period of 36 months, reflecting the recovery process due to foreclosure moratoria. The LGD estimates have increased in 2017 following implementation of new models in 2016 that capture maximum expected losses during an economic cycle. Actual LGD values have continued to decrease due to improving house prices.

Table 34: IRB models – estimated and actual values (retail)

| | PD | | LGD | | EAD | |
|--|----------------|--------------|----------------|--------------|----------------|--------------|
| | Estimated % | Actuals % | Estimated % | Actuals % | Estimated % | Actuals % |
| 2017 | | | | | | |
| UK | | | | | | |
| – HSBC residential mortgage | 0.44 | 0.28 | 9.74 | 0.88 | 0.26 | 0.24 |
| – FD residential mortgages | 0.48 | 0.41 | 2.11 | 0.45 | 1.09 | 0.91 |
| – HSBC credit card | 0.92 | 0.77 | 90.86 | 85.68 | 1.10 | 1.07 |
| – HSBC personal loans | 1.94 | 1.62 | 87.77 | 79.90 | 1.58 | 1.50 |
| – Business Banking (Retail SME) | 2.57 | 2.64 | 73.87 | 70.25 | 1.90 | 1.51 |
| Hong Kong | | | | | | |
| – HSBC personal residential mortgage | 0.72 | 0.04 | 1.43 | 0.14 | 0.05 | 0.05 |
| – Hang Seng personal residential mortgage | 0.42 | 0.14 | 5.18 | 0.59 | 0.14 | 0.14 |
| – HSBC credit card | 0.65 | 0.28 | 89.33 | 76.11 | 0.47 | 0.50 |
| – HSBC personal instalment loans | 2.34 | 1.51 | 89.07 | 80.05 | 1.25 | 1.14 |
| US | | | | | | |
| – HSBC Mortgage Corporation first lien | 1.91 | 0.80 | 53.27 | 22.22 | 0.37 | 0.36 |
| 2016 | | | | | | |
| UK | | | | | | |
| – HSBC residential mortgage | 0.50 | 0.35 | 10.53 | 1.09 | 0.34 | 0.31 |
| – FD residential mortgages | 0.49 | 0.43 | 3.06 | 0.55 | 0.95 | 0.80 |
| – HSBC credit card | 0.89 | 0.75 | 91.72 | 89.92 | 1.03 | 1.00 |
| – HSBC personal loans | 1.84 | 1.52 | 88.26 | 79.08 | 1.36 | 1.29 |
| – Business Banking (Retail SME) | 2.40 | 2.47 | 93.56 | 82.63 | 1.80 | 1.64 |
| Hong Kong | | | | | | |
| – HSBC personal residential mortgage | 0.79 | 0.04 | 4.52 | 0.97 | 0.04 | 0.03 |
| – Hang Seng personal residential mortgage | 0.49 | 0.16 | 4.48 | 0.62 | 0.12 | 0.12 |
| – HSBC credit card | 0.69 | 0.30 | 88.97 | 82.48 | 0.52 | 0.56 |
| – HSBC personal instalment loans | 2.46 | 1.78 | 89.28 | 69.62 | 1.44 | 1.33 |
| US | | | | | | |
| – Consumer Lending real estate first lien | 5.30 | 4.29 | 74.22 | 51.89 | 3.53 | 3.49 |
| – Mortgage Services real estate first lien | 6.16 | 3.77 | 68.26 | 51.79 | 3.37 | 3.34 |
| – HSBC Mortgage Corporation first lien | 2.20 | 1.27 | 41.18 | 29.25 | 0.50 | 0.50 |
| 2015 | | | | | | |
| UK | | | | | | |
| – HSBC residential mortgage | 0.45 | 0.22 | 16.43 | 3.54 | 0.17 | 0.17 |
| – FD residential mortgages | 0.40 | 0.11 | 12.13 | 10.89 | 0.22 | 0.20 |
| – HSBC credit card | 1.06 | 0.86 | 91.54 | 88.42 | 1.23 | 1.19 |
| – HSBC personal loans | 1.93 | 1.23 | 82.10 | 78.46 | 1.18 | 1.13 |
| – Business Banking (Retail SME) | 2.26 | 2.21 | 76.06 | 71.78 | 1.57 | 1.47 |
| Hong Kong | | | | | | |
| – HSBC personal residential mortgage | 0.79 | 0.03 | 1.90 | 0.03 | 0.04 | 0.03 |
| – Hang Seng personal residential mortgage | 0.46 | 0.14 | 4.12 | 0.57 | 0.11 | 0.11 |
| – HSBC credit card | 0.67 | 0.32 | 90.40 | 81.75 | 0.52 | 0.58 |
| – HSBC personal instalment loans | 2.40 | 2.02 | 89.43 | 69.59 | 1.69 | 1.51 |
| US | | | | | | |
| – Consumer Lending real estate first lien | 5.92 | 5.47 | 75.98 | 51.60 | 5.37 | 5.31 |

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| | | | | | | |
|--|------|------|-------|-------|------|------|
| – Mortgage Services real estate first lien | 6.96 | 5.96 | 69.59 | 54.09 | 7.97 | 7.88 |
| – HSBC Mortgage Corporation first lien | 4.66 | 2.08 | 29.63 | 37.19 | 0.70 | 0.69 |

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Table 34: IRB models – estimated and actual values (retail) (continued)

| | PD | | LGD | | EAD | |
|--|----------------|--------------|----------------|--------------|----------------|--------------|
| | Estimated % | Actuals % | Estimated % | Actuals % | Estimated % | Actuals % |
| 2014 | | | | | | |
| UK | | | | | | |
| – HSBC residential mortgage | 0.50 | 0.31 | 15.82 | 4.68 | 0.24 | 0.23 |
| – HSBC credit card | 1.37 | 1.07 | 91.11 | 86.30 | 1.83 | 1.78 |
| – HSBC personal loans | 2.28 | 1.57 | 81.56 | 80.45 | 1.52 | 1.46 |
| – Business Banking (Retail SME) | 2.83 | 2.57 | 73.04 | 68.17 | 2.00 | 1.88 |
| Hong Kong | | | | | | |
| – HSBC personal residential mortgage | 0.72 | 0.04 | 1.26 | 0.35 | 0.03 | 0.03 |
| – HSBC credit card | 0.62 | 0.32 | 92.91 | 88.13 | 0.55 | 0.59 |
| – HSBC personal instalment loans | 2.37 | 2.04 | 89.69 | 87.66 | 1.77 | 1.63 |
| US | | | | | | |
| – Consumer Lending real estate first lien | 7.31 | 7.72 | 77.16 | 60.29 | 7.83 | 7.72 |
| – Mortgage Services real estate first lien | 9.43 | 8.12 | 71.40 | 60.17 | 7.51 | 7.43 |
| – HSBC Mortgage Corporation first lien | 5.24 | 2.28 | 29.63 | 39.36 | 1.00 | 1.00 |
| 2013 | | | | | | |
| UK | | | | | | |
| – HSBC residential mortgage | 0.55 | 0.38 | 17.30 | 6.40 | 0.32 | 0.31 |
| – HSBC credit card | 1.54 | 1.27 | 88.10 | 84.10 | 1.70 | 1.67 |
| – HSBC personal loans | 3.57 | 2.35 | 85.40 | 73.00 | 2.19 | 2.11 |
| – Business Banking (Retail SME) | 2.39 | 2.61 | 78.00 | 70.00 | 2.03 | 1.99 |
| Hong Kong | | | | | | |
| – HSBC personal residential mortgage | 0.71 | 0.03 | 1.84 | 0.43 | 0.03 | 0.03 |
| – HSBC credit card | 0.63 | 0.33 | 91.41 | 84.58 | 0.56 | 0.59 |
| – HSBC personal instalment loans | 2.20 | 1.99 | 90.07 | 96.16 | 1.69 | 1.55 |
| US | | | | | | |
| – Consumer Lending real estate first lien | 7.74 | 8.22 | 67.13 | 64.93 | 7.08 | 6.72 |
| – Mortgage Services real estate first lien | 10.15 | 9.68 | 60.04 | 62.92 | 6.12 | 5.88 |
| – HSBC Mortgage Corporation first lien | 4.64 | 4.43 | 49.85 | 37.17 | 2.40 | 2.40 |

Model performance

Model validation is subject to global internal standards designed to support a comprehensive quantitative and qualitative process within a cycle of model monitoring and validation that includes:

- investigation of model stability;
- model performance measured through testing the model’s outputs against actual outcomes; and
- model use within the business, e.g. user input data quality, override activity and the assessment of results from key controls around the usage of the rating system as a whole within the overall credit process.

Models are validated against a series of metrics and triggers approved by the appropriate governance committee.

Model

performance metrics, and any remedial actions in the event of a trigger breach, are reported at the Wholesale and RBWM MOCs. We also disclose model performance reports for our IRB models to our lead regulator, the PRA, quarterly.

A large number of models are used within the Group, and data at individual model level is, in most cases, immaterial in the context of the overall Group. We therefore disclose data covering most wholesale models, including corporate models on an aggregated basis, and on the most material retail models.

Tables 35 and 36 below validate the reliability of PD calculations by comparing the PD used in IRB calculations with actual default experience.

Table 35: Wholesale IRB exposure – back-testing of probability of default (PD) per portfolio¹

| PD range | External rating equivalent (S&P) | External rating equivalent (Moody’s) | External rating equivalent (Fitch) | Weighted average PD % | Arithmetic average PD by obligors % | Number of obligors End of previous year | End of the year | Defaulted obligors in the year | of which: new defaulted obligors the year | Average historical annual default rate % |
|-------------------------|----------------------------------|--------------------------------------|------------------------------------|-----------------------|-------------------------------------|---|-----------------|--------------------------------|---|--|
| 2017 | | | | | | | | | | |
| Sovereigns ² | | | | | | | | | | |
| 0.00 to <0.15 | AAA to BBB | Aaa to Baa2 | AAA to BBB | 0.02 | 0.05 | 43 | 53 | — | — | — |
| 0.15 to <0.25 | BBB- | Baa3 | BBB- | 0.22 | 0.22 | 7 | 7 | — | — | — |
| 0.25 to <0.50 | BBB- | Baa3 | BBB- | 0.37 | 0.37 | 7 | 5 | — | — | — |
| 0.50 to <0.75 | BB+ to BB- | Ba1 to Ba2 | BB+ to BB- | 0.63 | 0.63 | 6 | 7 | — | — | — |
| 0.75 to <2.50 | BB- to B- | Ba3 to B2 | BB- to B- | 2.02 | 1.65 | 17 | 23 | — | — | — |
| 2.5 to <10.00 | B to B- | B2 to Caa1 | CCC+ to CCC | 3.90 | 6.09 | 18 | 21 | — | — | — |
| 10.00 to <100.00 | B- to C | Caa1 to C | CCC to C | 12.89 | 12.57 | 7 | 8 | — | — | 2.67 |
| Banks | | | | | | | | | | |
| 0.00 to <0.15 | AAA to A- | Aaa to Baa1 | AAA to BBB+ | 0.05 | 0.08 | 250 | 258 | — | — | — |
| 0.15 to <0.25 | BBB+ | Baa2 | BBB | 0.22 | 0.22 | 72 | 62 | — | — | — |
| 0.25 to <0.50 | BBB | Baa3 | BBB- | 0.37 | 0.37 | 59 | 48 | — | — | — |
| 0.50 to <0.75 | BBB- | Baa3 | BBB- | 0.63 | 0.63 | 68 | 58 | — | — | — |

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| | | | | | | | | | | |
|---------------------|---------------|----------------|----------------|-------|-------|--------|--------|-----|----|-------|
| 0.75 to <2.50 | BB+ to BB- | Ba1 to B1 | BB+ to B+ | 1.20 | 1.40 | 122 | 119 | — | — | — |
| 2.5 to <10.00 | B+ to B- | B2 to Caa1 | B to CCC+ | 4.63 | 4.71 | 100 | 75 | — | — | 0.20 |
| 10.00 to <100.00 | CCC+ to C | Caa1 to C | CCC to C | 17.91 | 14.66 | 32 | 18 | — | — | 4.68 |
| Corporates | | | | | | | | | | |
| 0.00 to <0.15 | AAA to A- | Aaa to Baa1 | AAA to BBB+ | 0.09 | 0.10 | 11,220 | 11,401 | 2 | — | 0.01 |
| 0.15 to <0.25 | BBB+ | Baa2 | BBB | 0.22 | 0.22 | 10,899 | 11,453 | 10 | 2 | 0.12 |
| 0.25 to <0.50 | BBB | Baa3 | BBB- | 0.37 | 0.37 | 12,161 | 11,675 | 20 | 3 | 0.25 |
| 0.50 to <0.75 | BBB- | Baa3 | BBB- | 0.63 | 0.63 | 10,920 | 10,508 | 29 | 2 | 0.46 |
| 0.75 to <2.50 | BB+ to BB- | Ba1 to B1 | BB+ to B+ | 1.37 | 1.45 | 35,150 | 34,911 | 244 | 12 | 0.91 |
| 2.5 to <10.00 | B+ to B- | B2 to Caa1 | B to CCC+ | 4.34 | 4.38 | 12,978 | 13,183 | 418 | 30 | 2.87 |
| 10.00 to <100.00 | CCC+ to C | Caa1 to C | CCC to C | 18.42 | 19.33 | 2,119 | 1,785 | 266 | 20 | 12.54 |

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| PD range | External rating equivalent (S&P) | External rating equivalent (Moody's) | External rating equivalent (Fitch) | Weighted average PD % | Arithmetic average PD by obligors % | Number of obligors End of previous year | End of the year | Defaulted obligors in the year | of which: new defaulted obligors in the year | Average historical annual default rate % |
|------------------|----------------------------------|--------------------------------------|------------------------------------|-----------------------|-------------------------------------|---|-----------------|--------------------------------|--|--|
| 2016 | | | | | | | | | | |
| Sovereigns | | | | | | | | | | |
| 0.00 to <0.15 | AAA to A- | Aaa to Baa1 | AAA to BBB+ | 0.02 | 0.05 | 60 | 60 | — | — | — |
| 0.15 to <0.25 | BBB+ | Baa2 | BBB | 0.22 | 0.22 | 8 | 11 | — | — | — |
| 0.25 to <0.50 | BBB | Baa3 | BBB- | 0.37 | 0.37 | 10 | 7 | — | — | — |
| 0.50 to <0.75 | BBB- | Baa3 | BBB- | 0.63 | 0.63 | 7 | 7 | — | — | — |
| 0.75 to <2.50 | BB+ to BB- | Ba1 to B1 | BB+ to B+ | 2.01 | 1.58 | 19 | 25 | — | — | — |
| 2.5 to <10.00 | B+ to B- | B2 to Caa1 | B to CCC+ | 4.66 | 5.32 | 35 | 27 | — | — | — |
| 10.00 to <100.00 | CCC+ to C | Caa1 to C | CCC to C | 20.27 | 21.07 | 14 | 16 | — | — | 1.67 |
| Banks | | | | | | | | | | |
| 0.00 to <0.15 | AAA to A- | Aaa to Baa1 | AAA to BBB+ | 0.05 | 0.08 | 235 | 250 | — | — | — |
| 0.15 to <0.25 | BBB+ | Baa2 | BBB | 0.22 | 0.22 | 91 | 72 | — | — | — |
| 0.25 to <0.50 | BBB | Baa3 | BBB- | 0.37 | 0.37 | 37 | 59 | — | — | — |
| 0.50 to <0.75 | BBB- | Baa3 | BBB- | 0.63 | 0.63 | 64 | 68 | — | — | — |
| 0.75 to <2.50 | BB+ to BB- | Ba1 to B1 | BB+ to B+ | 1.16 | 1.36 | 139 | 122 | — | — | — |
| 2.5 to <10.00 | B+ to B- | B2 to Caa1 | B to CCC+ | 4.96 | 4.87 | 109 | 100 | — | — | 0.29 |
| 10.00 to <100.00 | CCC+ to C | Caa1 to C | CCC to C | 11.38 | 11.55 | 29 | 32 | — | — | 1.70 |
| Corporates | | | | | | | | | | |
| 0.00 to <0.15 | AAA to A- | Aaa to Baa1 | AAA to BBB+ | 0.09 | 0.10 | 11,742 | 11,245 | 2 | — | 0.01 |
| 0.15 to <0.25 | BBB+ | Baa2 | BBB | 0.22 | 0.22 | 11,003 | 10,904 | 28 | 1 | 0.13 |
| 0.25 to <0.50 | BBB | Baa3 | BBB- | 0.37 | 0.37 | 12,384 | 12,183 | 48 | 1 | 0.28 |
| 0.50 to <0.75 | BBB- | Baa3 | BBB- | 0.63 | 0.63 | 10,516 | 10,924 | 54 | 2 | 0.50 |
| | | Ba1 to B1 | BB+ to B+ | 1.39 | 1.47 | 36,308 | 35,588 | 416 | 31 | 1.03 |

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| | | | | | | | | | | |
|----------|-----------|------------|-----------|-------|-------|--------|--------|-----|----|-------|
| 0.75 to | BB+ to | | | | | | | | | |
| <2.50 | BB- | | | | | | | | | |
| 2.5 to | B+ to B- | B2 to Caa1 | B to CCC+ | 4.39 | 4.43 | 13,419 | 13,488 | 437 | 21 | 3.06 |
| <10.00 | | | | | | | | | | |
| 10.00 to | CCC+ to C | Caa1 to C | CCC to C | 19.08 | 20.29 | 2,319 | 2,141 | 285 | 12 | 13.42 |
| <100.00 | | | | | | | | | | |

¹Data represents an annual view, analysed at 30 September.

²The CRR to external ratings mapping has been updated for Sovereign portfolios to reflect the current CRR master scale.

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Table 36: Retail IRB exposure – back-testing of probability of default (PD) per portfolio¹

| PD range | Weighted average PD | Arithmetic average PD by obligors | Number of obligors | | Defaulted obligors in the year | of which: new defaulted obligors in the year | Average historical annual default rate |
|-------------------------------|---------------------|-----------------------------------|----------------------|-----------------|--------------------------------|--|--|
| | | | End of previous year | End of the year | | | |
| 2017 | | | | | | | |
| Retail – Secured | | | | | | | |
| by real estate | | | | | | | |
| non-SME | | | | | | | |
| 0.00 to <0.15 | 0.06 | 0.06 | 662,941 | 700,284 | 238 | 4 | 0.03 |
| 0.15 to <0.25 | 0.19 | 0.19 | 62,640 | 59,539 | 69 | — | 0.08 |
| 0.25 to <0.50 | 0.36 | 0.35 | 63,554 | 64,051 | 97 | — | 0.13 |
| 0.50 to <0.75 | 0.60 | 0.60 | 26,579 | 27,095 | 63 | — | 0.21 |
| 0.75 to <2.50 | 1.33 | 1.34 | 61,808 | 59,299 | 277 | 1 | 0.43 |
| 2.50 to <10.00 | 4.63 | 4.56 | 18,796 | 17,156 | 379 | 1 | 1.94 |
| 10.00 to <100.00 | 27.70 | 24.33 | 8,090 | 5,358 | 1,308 | 15 | 19.49 |
| Retail – qualifying revolving | | | | | | | |
| 0.00 to <0.15 | 0.07 | 0.07 | 2,903,455 | 3,128,491 | 1,403 | 100 | 0.05 |
| 0.15 to <0.25 | 0.19 | 0.19 | 702,956 | 715,693 | 643 | 25 | 0.10 |
| 0.25 to <0.50 | 0.36 | 0.36 | 641,717 | 666,802 | 1,229 | 44 | 0.21 |
| 0.50 to <0.75 | 0.61 | 0.62 | 316,331 | 317,666 | 1,075 | 36 | 0.36 |
| 0.75 to <2.50 | 1.35 | 1.33 | 717,012 | 677,685 | 5,202 | 131 | 0.85 |
| 2.50 to <10.00 | 4.39 | 4.30 | 214,063 | 217,996 | 6,465 | 79 | 3.06 |
| 10.00 to <100.00 | 26.42 | 26.77 | 66,144 | 52,014 | 14,140 | 10 | 19.19 |
| Retail – other non-SME | | | | | | | |
| 0.00 to <0.15 | 0.08 | 0.08 | 123,797 | 143,758 | 216 | 5 | 0.15 |
| 0.15 to <0.25 | 0.19 | 0.19 | 75,671 | 84,219 | 112 | 6 | 0.13 |
| 0.25 to <0.50 | 0.36 | 0.36 | 109,873 | 118,254 | 327 | 18 | 0.25 |
| 0.50 to <0.75 | 0.61 | 0.62 | 37,381 | 39,622 | 208 | 8 | 0.48 |
| 0.75 to <2.50 | 1.36 | 1.41 | 94,398 | 93,147 | 1,261 | 61 | 1.05 |
| 2.50 to <10.00 | 4.63 | 4.88 | 49,426 | 39,977 | 1,811 | 55 | 3.03 |
| 10.00 to <100.00 | 42.70 | 42.41 | 12,114 | 5,550 | 4,380 | 9 | 34.31 |
| Retail – other SME | | | | | | | |
| 0.00 to <0.15 | 0.11 | 0.11 | 66,454 | 65,482 | 45 | — | 0.09 |
| 0.15 to <0.25 | 0.20 | 0.20 | 42,675 | 43,437 | 66 | — | 0.29 |
| 0.25 to <0.50 | 0.38 | 0.37 | 126,549 | 132,200 | 451 | 11 | 0.51 |
| 0.50 to <0.75 | 0.63 | 0.63 | 124,441 | 128,686 | 739 | 11 | 0.83 |
| 0.75 to <2.50 | 1.55 | 1.38 | 316,020 | 305,501 | 4,562 | 82 | 1.77 |
| 2.50 to <10.00 | 4.77 | 4.68 | 167,107 | 148,916 | 7,730 | 111 | 4.48 |
| 10.00 to <100.00 | 17.47 | 19.38 | 48,949 | 39,032 | 10,329 | 48 | 17.57 |

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Table 36: Retail IRB exposure – Back-testing of probability of default (PD) per portfolio¹ (Continued)

| PD range | Weighted average PD | Arithmetic average PD by obligors | Number of obligors | | Defaulted obligors in the year | of which: new defaulted obligors in the year | Average historical annual default rate |
|--|---------------------|-----------------------------------|----------------------|-----------------|--------------------------------|--|--|
| | | | End of previous year | End of the year | | | |
| 2016 | | | | | | | |
| Retail – Secured by real estate non-SME | | | | | | | |
| 0.00 to <0.15 | 0.06 | 0.06 | 454,384 | 472,033 | 196 | 3 | 0.03 |
| 0.15 to <0.25 | 0.20 | 0.19 | 42,290 | 40,896 | 37 | — | 0.07 |
| 0.25 to <0.50 | 0.39 | 0.40 | 78,127 | 76,119 | 154 | — | 0.28 |
| 0.50 to <0.75 | 0.59 | 0.59 | 16,323 | 16,596 | 22 | — | 0.10 |
| 0.75 to <2.50 | 1.27 | 1.32 | 105,008 | 70,068 | 967 | 2 | 1.10 |
| 2.50 to <10.00 | 4.83 | 4.74 | 52,157 | 25,774 | 739 | 12 | 3.68 |
| 10.00 to <100.00 | 28.19 | 27.67 | 55,403 | 11,411 | 2,873 | 152 | 33.03 |
| Retail – qualifying revolving | | | | | | | |
| 0.00 to <0.15 | 0.07 | 0.07 | 3,081,238 | 3,212,010 | 1,556 | 94 | 0.05 |
| 0.15 to <0.25 | 0.19 | 0.20 | 739,131 | 686,815 | 661 | 15 | 0.10 |
| 0.25 to <0.50 | 0.36 | 0.35 | 577,288 | 601,986 | 1,265 | 18 | 0.19 |
| 0.50 to <0.75 | 0.61 | 0.62 | 291,303 | 301,068 | 1,060 | 15 | 0.33 |
| 0.75 to <2.50 | 1.35 | 1.33 | 649,838 | 657,683 | 5,519 | 80 | 0.79 |
| 2.50 to <10.00 | 4.42 | 4.30 | 180,889 | 184,846 | 5,739 | 29 | 2.87 |
| 10.00 to <100.00 | 25.88 | 28.08 | 62,487 | 46,776 | 14,159 | 2 | 18.71 |
| Retail – other non-SME | | | | | | | |
| 0.00 to <0.15 | 0.09 | 0.09 | 113,178 | 150,991 | 142 | 6 | 0.13 |
| 0.15 to <0.25 | 0.19 | 0.19 | 70,557 | 82,256 | 91 | 3 | 0.13 |
| 0.25 to <0.50 | 0.34 | 0.36 | 135,970 | 149,246 | 339 | 65 | 0.28 |
| 0.50 to <0.75 | 0.60 | 0.60 | 67,774 | 67,475 | 313 | 29 | 0.53 |
| 0.75 to <2.50 | 1.36 | 1.37 | 146,702 | 145,343 | 1,171 | 122 | 1.14 |
| 2.50 to <10.00 | 4.57 | 4.91 | 67,842 | 59,099 | 1,584 | 93 | 3.20 |
| 10.00 to <100.00 | 25.26 | 26.44 | 20,318 | 12,085 | 3,722 | 9 | 19.94 |
| Retail – other SME | | | | | | | |
| 0.00 to <0.15 | 0.10 | 0.09 | 119,633 | 119,245 | 142 | 1 | 0.09 |
| 0.15 to <0.25 | 0.20 | 0.20 | 72,127 | 79,047 | 239 | 4 | 0.27 |
| 0.25 to <0.50 | 0.37 | 0.37 | 150,563 | 163,934 | 737 | 26 | 0.49 |
| 0.50 to <0.75 | 0.60 | 0.60 | 124,371 | 124,797 | 998 | 22 | 0.84 |
| 0.75 to <2.50 | 1.54 | 1.38 | 275,325 | 262,619 | 4,569 | 117 | 1.66 |
| 2.50 to <10.00 | 4.81 | 4.73 | 155,368 | 133,616 | 6,953 | 62 | 4.27 |
| 10.00 to <100.00 | 18.06 | 20.84 | 38,418 | 26,680 | 6,982 | 22 | 16.62 |

¹Data represents an annual view, analysed at 30 September.

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Counterparty credit risk

Counterparty credit risk management

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.

Four approaches may be used under CRD IV to calculate exposure values for CCR: mark-to-market, original exposure, standardised and IMM. Exposure values calculated under these approaches are used to determine RWAs.

Across the Group, we use the mark-to-market and IMM approaches.

Under the mark-to-market approach, the EAD is calculated as current exposure plus regulatory add-ons. We use this approach for all products not covered by our IMM permission. Under the IMM approach, EAD is calculated by multiplying the effective expected positive exposure with a multiplier called 'alpha'.

Alpha (set to a default value of 1.4) accounts for several portfolio features that increase EL above that indicated by effective expected positive exposure in the event of default, such as:

- co-variance of exposures;
- correlation between exposures and default;
- level of volatility/correlation that might coincide with a downturn;
- concentration risk; and
- model risk.

The effective expected exposure is derived from simulation, pricing and aggregation internal models approved by regulators. The IMM model is subject to ongoing model validation including monthly model performance monitoring. From a risk management perspective, including daily monitoring of credit limit utilisation, products not covered by IMM are subject to conservative asset class add-on calculated or repo VaR outside of the IMM framework.

The potential future exposure ('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.

The models and methodologies used in the calculation of CCR are approved by the Global Markets MOC. Models are subject to ongoing monitoring and validation. Additionally, they are subject to independent review at inception and annually thereafter.

Credit valuation adjustment

Credit valuation adjustment ('CVA') risk is the risk of adverse moves in the credit valuation adjustments taken for expected credit losses on derivative transactions. Where we have both specific risk VaR approval and IMM approval for a product, the CVA VaR approach has been used to calculate the CVA capital charge. Where we do not hold both approvals, the standardised approach has been applied. Certain counterparty exposures are exempt from CVA, such as non-financial counterparties and sovereigns.

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. Approximately 98% of collateral held as variation margin under CSAs is either cash or liquid government securities.

Further information on gross fair value exposure and the offset due to legally enforceable netting and collateral is set out on page 275 of the Annual Report and Accounts 2017.

Credit rating downgrade

A credit rating downgrade clause in a Master Agreement or a credit rating downgrade threshold clause in a 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 2017, the potential value of the additional collateral pertaining to International Swaps and Derivatives Association Credit Support Annex ('CSA') downgrade thresholds that we would need to post with counterparties in the event of a one-notch downgrade of our rating was \$0.3bn (2016: \$0.3bn) and for a two-notch downgrade was \$0.5bn (2016: \$0.8bn).

Pillar 3 Disclosures at 31 December 2017

Counterparty credit risk exposures

Table 37: Counterparty credit risk exposure – by exposure class, product and geographical region

| | Footnotes | Exposure value | | | | | Total \$bn |
|---|-----------|----------------|------|------|------------------|------------------|---------------|
| | | Europe | Asia | MENA | North America | Latin America | |
| | | \$bn | \$bn | \$bn | \$bn | \$bn | |
| By exposure class | | | | | | | |
| IRB advanced approach | | 63.0 | 33.0 | 0.7 | 20.4 | 1.2 | 118.3 |
| – central governments and central banks | | 4.6 | 4.8 | 0.3 | 2.2 | 0.6 | 12.5 |
| – institutions | | 26.8 | 18.6 | 0.2 | 8.6 | 0.2 | 54.4 |
| – corporates | | 31.6 | 9.6 | 0.2 | 9.6 | 0.4 | 51.4 |
| IRB foundation approach | | 3.4 | — | 0.3 | — | — | 3.7 |
| – corporates | | 3.4 | — | 0.3 | — | — | 3.7 |
| Standardised approach | | 6.2 | 0.4 | 2.2 | — | 0.7 | 9.5 |
| – central governments and central banks | | 5.6 | — | 1.9 | — | — | 7.5 |
| – institutions | | 0.1 | — | — | — | — | 0.1 |
| – corporates | | 0.5 | 0.4 | 0.3 | — | 0.7 | 1.9 |
| CVA advanced | 2 | — | — | — | — | — | — |
| CVA standardised | 2 | — | — | — | — | — | — |
| CCP standardised | | 16.5 | 8.0 | — | 11.1 | 0.4 | 36.0 |
| At 31 Dec 2017 | | 89.1 | 41.4 | 3.2 | 31.5 | 2.3 | 167.5 |
| By product | | | | | | | |
| Derivatives (OTC and exchange traded derivatives) | | 52.3 | 31.8 | 1.0 | 24.3 | 1.6 | 111.0 |
| SFTs | | 34.1 | 5.8 | 2.2 | 7.2 | 0.7 | 50.0 |
| Other | 1 | 2.7 | 3.8 | — | — | — | 6.5 |
| CVA advanced | 2 | — | — | — | — | — | — |
| CVA standardised | 2 | — | — | — | — | — | — |
| CCP default funds | 3 | — | — | — | — | — | — |
| At 31 Dec 2017 | | 89.1 | 41.4 | 3.2 | 31.5 | 2.3 | 167.5 |
| By exposure class | | | | | | | |
| IRB advanced approach | | 62.3 | 36.1 | 0.5 | 22.0 | 0.7 | 121.6 |
| – central governments and central banks | | 5.0 | 4.1 | — | 3.0 | 0.2 | 12.3 |
| – institutions | | 27.9 | 19.8 | 0.2 | 9.2 | 0.4 | 57.5 |
| – corporates | | 29.4 | 12.2 | 0.3 | 9.8 | 0.1 | 51.8 |
| IRB foundation approach | | 5.0 | — | 0.5 | — | — | 5.5 |
| – corporates | | 5.0 | — | 0.5 | — | — | 5.5 |
| Standardised approach | | 6.5 | 0.7 | 2.1 | 0.1 | 0.7 | 10.1 |
| – central governments and central banks | | 5.9 | — | 1.4 | — | — | 7.3 |
| – institutions | | — | — | 0.2 | — | — | 0.2 |
| – corporates | | 0.6 | 0.7 | 0.5 | 0.1 | 0.7 | 2.6 |
| CVA advanced | 2 | — | — | — | — | — | — |
| CVA standardised | 2 | — | — | — | — | — | — |
| CCP standardised | | 13.3 | 5.5 | — | 8.8 | — | 27.6 |
| At 31 Dec 2016 | | 87.1 | 42.3 | 3.1 | 30.9 | 1.4 | 164.8 |
| By product | | | | | | | |
| Derivatives (OTC and exchange traded derivatives) | | 58.9 | 33.8 | 1.6 | 21.5 | 1.2 | 117.0 |
| SFTs | | 25.3 | 5.0 | 1.5 | 9.4 | 0.2 | 41.4 |

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| | | | | | | | |
|-------------------|---|------|------|-----|------|-----|-------|
| Other | 1 | 2.9 | 3.5 | — | — | — | 6.4 |
| CVA advanced | 2 | — | — | — | — | — | — |
| CVA standardised | 2 | — | — | — | — | — | — |
| CCP default funds | 3 | — | — | — | — | — | — |
| At 31 Dec 2016 | | 87.1 | 42.3 | 3.1 | 30.9 | 1.4 | 164.8 |

¹ Includes free deliveries not deducted from regulatory capital.

² The RWA impact due to the CVA capital charge is calculated based on the same exposures as the IRB and standardised approaches. The table above does not present any exposures for CVA to avoid double counting.

³ Default fund contributions are cash balances posted to CCPs by all members. These cash balances have nil impact on reported exposure.

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Table 38: Counterparty credit risk – RWAs by exposure class, product and geographical region

| | Footnotes | RWAs | | | | | Capital | |
|---|-----------|--------|------|------|---------------|---------------|----------------|------|
| | | Europe | Asia | MENA | North America | Latin America | Total required | |
| | | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| By exposure class | | | | | | | | |
| IRB advanced approach | | 21.2 | 9.9 | 0.6 | 7.3 | 0.9 | 39.9 | 3.2 |
| – central governments and central banks | | 0.7 | 0.1 | 0.4 | 0.8 | 0.4 | 2.4 | 0.2 |
| – institutions | | 7.1 | 5.0 | 0.1 | 2.1 | 0.2 | 14.5 | 1.2 |
| – corporates | | 13.4 | 4.8 | 0.1 | 4.4 | 0.3 | 23.0 | 1.8 |
| IRB foundation approach | | 1.7 | — | 0.1 | — | — | 1.8 | 0.1 |
| – corporates | | 1.7 | — | 0.1 | — | — | 1.8 | 0.1 |
| Standardised approach | | 0.6 | 0.4 | 0.3 | — | 0.6 | 1.9 | 0.2 |
| – central governments and central banks | | — | — | — | — | — | — | — |
| – institutions | | — | — | 0.0 | — | — | 0.0 | 0.0 |
| – corporates | | 0.6 | 0.4 | 0.3 | — | 0.6 | 1.9 | 0.2 |
| CVA advanced | 2 | 2.8 | — | — | — | — | 2.8 | 0.2 |
| CVA standardised | 2 | 0.8 | 2.4 | 0.1 | 3.2 | 0.2 | 6.7 | 0.6 |
| CCP standardised | | 0.7 | 0.3 | — | 0.4 | — | 1.4 | 0.1 |
| At 31 Dec 2017 | | 27.8 | 13.0 | 1.1 | 10.9 | 1.7 | 54.5 | 4.4 |
| By product | | | | | | | | |
| Derivatives (OTC and exchange traded derivatives) | | 17.3 | 8.6 | 0.6 | 5.4 | 0.9 | 32.8 | 2.6 |
| SFTs | | 5.0 | 0.6 | 0.4 | 2.1 | 0.6 | 8.7 | 0.7 |
| Other | 1 | 1.5 | 1.3 | — | — | — | 2.8 | 0.2 |
| CVA advanced | 2 | 2.8 | — | — | — | — | 2.8 | 0.2 |
| CVA standardised | 2 | 0.8 | 2.4 | 0.1 | 3.2 | 0.2 | 6.7 | 0.6 |
| CCP default funds | 3 | 0.4 | 0.1 | — | 0.2 | — | 0.7 | 0.1 |
| At 31 Dec 2017 | | 27.8 | 13.0 | 1.1 | 10.9 | 1.7 | 54.5 | 4.4 |
| By exposure class | | | | | | | | |
| IRB advanced approach | | 21.3 | 11.2 | 0.2 | 8.6 | 0.3 | 41.6 | 3.3 |
| – central governments and central banks | | 0.9 | 0.2 | — | 0.5 | 0.1 | 1.7 | 0.1 |
| – institutions | | 8.1 | 5.2 | — | 2.6 | 0.1 | 16.0 | 1.3 |
| – corporates | | 12.3 | 5.8 | 0.2 | 5.5 | 0.1 | 23.9 | 1.9 |
| IRB foundation approach | | 1.7 | — | 0.2 | — | — | 1.9 | 0.2 |
| – corporates | | 1.7 | — | 0.2 | — | — | 1.9 | 0.2 |
| Standardised approach | | 0.8 | 0.7 | 0.6 | 0.1 | 0.6 | 2.8 | 0.2 |
| – central governments and central banks | | — | — | — | — | — | — | — |
| – institutions | | 0.1 | — | 0.1 | — | — | 0.2 | — |
| – corporates | | 0.7 | 0.7 | 0.5 | 0.1 | 0.6 | 2.6 | 0.2 |
| CVA advanced | 2 | 3.5 | — | — | — | — | 3.5 | 0.3 |
| CVA standardised | 2 | 2.8 | 4.0 | 0.2 | 3.6 | 0.3 | 10.9 | 0.9 |
| CCP standardised | | 0.7 | 0.3 | — | 0.3 | — | 1.3 | 0.1 |
| At 31 Dec 2016 | | 30.8 | 16.2 | 1.2 | 12.6 | 1.2 | 62.0 | 5.0 |
| By product | | | | | | | | |
| Derivatives (OTC and exchange traded derivatives) | | 18.2 | 10.6 | 1.0 | 6.6 | 0.9 | 37.3 | 3.0 |
| SFTs | | 4.5 | 0.6 | — | 2.1 | 0.1 | 7.3 | 0.6 |
| Other | 1 | 1.4 | 0.9 | — | — | — | 2.3 | 0.2 |

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| | | | | | | | | |
|-------------------|---|------|------|-----|------|-----|------|-----|
| CVA advanced | 2 | 3.5 | — | — | — | — | 3.5 | 0.3 |
| CVA standardised | 2 | 2.8 | 4.0 | 0.2 | 3.6 | 0.3 | 10.9 | 0.9 |
| CCP default funds | 3 | 0.4 | 0.1 | — | 0.2 | — | 0.7 | — |
| At 31 Dec 2016 | | 30.8 | 16.2 | 1.2 | 12.5 | 1.3 | 62.0 | 5.0 |

¹ Includes free deliveries not deducted from regulatory capital.

² The RWA impact due to the CVA capital charge is calculated based on the exposures under the IRB and standardised approaches. No additional exposures are taken into account.

³ Default fund contributions are cash balances posted to CCPs by all members. These cash balances are not included in the total reported exposure.

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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 HSBC's perspective materially increases as the value of the counterparty's capital or financing instruments referenced in the contract decreases. It is 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 regional Traded Risk functions are responsible for the control and monitoring process within an overarching Group framework and limit framework.

Central counterparties ('CCPs')

While exchange traded derivatives have been cleared through CCPs for many years, recent regulatory initiatives designed to reduce systemic risk in the banking system are directing increasing volumes of OTC derivatives to be cleared through CCPs.

A dedicated CCP risk team has been established 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 Group's risk will be transferred from being distributed among individual, bilateral counterparties to a significant level of risk concentration on CCPs. We have developed a risk appetite framework to manage risk accordingly, on an individual CCP and global basis.

Securitisation

HSBC securitisation strategy

HSBC acts as originator, sponsor, liquidity provider and derivative

counterparty to our own originated and sponsored securitisations, as well as those of third parties. Our strategy is to use securitisation to meet our needs for aggregate funding or capital management, to the extent that market, regulatory treatments and other conditions are suitable, and for customer facilitation. We do not provide support to any of our originated or sponsored securitisations, and it is not our policy to do so.

We have senior exposures to the securities investment conduits ('SICs'): Mazarin Funding Limited, Barion Funding Limited and Malachite Funding Limited, and we hold all of the commercial paper issued by Solitaire Funding Limited. These are considered legacy businesses, and exposures are being repaid as the securities they hold amortise.

HSBC securitisation activity

Our roles in the securitisation process are as follows:

• **Originator:** where we originate the assets being securitised, either directly or indirectly;

• **Sponsor:** where we establish and manage a securitisation programme that purchases exposures from third parties; and

• **Investor:** where we invest in a securitisation transaction directly or provide derivatives or liquidity facilities to a securitisation.

HSBC as originator

We use SPEs to securitise customer loans and advances and other debt that we have originated in order to diversify our sources of funding for asset origination and for capital efficiency purposes. In such cases, we transfer the loans and advances to the SPEs for cash, and the SPEs issue debt securities to investors to fund the cash purchases.

In addition, we use SPEs to mitigate the capital absorbed by some of the customer loans and advances we have originated. Credit derivatives are used to transfer the credit risk associated with such customer loans and advances to an SPE, using an approach commonly known as synthetic securitisation by which the SPE writes CDS protection for HSBC.

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HSBC as sponsor

We are sponsor to a number of types of securitisation entities, details of which can be found in Note 19 on the Financial Statements of the Annual Report and Accounts 2017 and the table below.

| Entity | Entity description and nature of exposure | Accounting consolidation | Regulatory consolidation | Regulatory treatment |
|-----------|--|--------------------------|--------------------------|--|
| Solitaire | Asset-backed commercial paper ('ABCP') conduit to which a first-loss letter of credit and transaction-specific liquidity facilities are provided | P | P | Look through to risk weights of underlying assets |
| Barion | Vehicle to which senior term funding is provided | P | O | |
| Malachite | Vehicle to which senior term funding is provided | P | O | Exposures (including derivatives and liquidity facilities) are risk-weighted as securitisation positions |
| Mazarin | Vehicle to which senior term funding is provided | P | O | |
| Regency | Multi-seller conduit to which senior liquidity facilities and programme-wide credit enhancement are provided | P | O | |

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HSBC as investor

We have exposure to third-party securitisations across a wide range of sectors in the form of investments, liquidity facilities and as a derivative counterparty. These are primarily legacy exposures.

Monitoring of securitisation positions

Securitisation positions are managed by a dedicated team that uses a combination of market standard systems and third-party data providers to monitor performance data and manage market and credit risks.

In the case of re-securitisation positions, similar processes are conducted in respect of the underlying securitisations.

Liquidity risk of securitised assets is consistently managed as part of the Group's liquidity and funding risk management framework and further details are provided on page 113 of the Annual Report and Accounts 2017.

Valuation of securitisation positions

The process of valuing our investments in securitisation exposures primarily focuses on quotations from third parties, observed trade levels and calibrated valuations from market standard models.

Our hedging and credit risk mitigation strategy, with regards to retained securitisation and re-securitisation exposures, is to continually review our positions.

Securitisation accounting treatment

For accounting purposes, we consolidate structured entities (including SPEs) when the substance of the relationship indicates that we control them; that is, we are exposed, or have rights, to variable returns from our involvement with the structured entity and have the ability to affect those returns through our power over the entity.

Full details of these assessments and our accounting policy on structured entities may be found in Note 1.2(a) and Note 19 on the Financial Statements respectively of the Annual Report and Accounts 2017.

We reassess the need to consolidate whenever there is a change in the substance of the relationship between HSBC and a structured entity.

HSBC enters into transactions in the normal course of business by which it transfers financial assets to structured entities. Depending on the circumstances, these transfers may either result in these financial assets being fully or partly derecognised, or continuing to be recognised in their entirety.

Full derecognition occurs when we transfer our contractual right to receive cash flows from the financial assets, or assume an obligation to pass on the cash flows from the assets, and transfer substantially all the risks and rewards of ownership. Only in the event that derecognition is achieved are sales and any resultant gains recognised in the financial statements.

Partial derecognition occurs when we sell or otherwise transfer financial assets in such a way that some but not substantially all of the risks and rewards of ownership are transferred and control is retained. These financial assets are recognised on the balance sheet to the extent of our continuing involvement and an associated liability is also recognised. The net carrying amount of the financial asset and associated liability will be based on the measurement basis of the financial asset, either the amortised cost or the fair value of the rights and obligations retained by the entity.

Further disclosure of such transfers may be found in Note 16 on the Financial Statements of the Annual Report and Accounts 2017.

Securitisation regulatory treatment

For regulatory purposes, any reduction in RWAs that would be achieved by our own originated securitisations must receive the PRA's permission and be justified by a commensurate transfer of credit risk to third parties. If achieved, the associated SPEs and underlying assets are not consolidated but exposures to them, including derivatives or liquidity facilities, are risk-weighted as securitisation positions.

For the majority of our securitisation non-trading book positions, we use the IRB approach, and within this principally the RBM, with lesser amounts on IAA and SFM. We also use the standardised approach for an immaterial amount of non-trading book positions. Securitisation positions in the trading book are overseen within Market Risk using the standardised approach.

Use of the IAA is limited to exposures arising from Regency Assets Limited related to liquidity facilities. Eligible ECAI rating methodology, which includes stress factors, is applied to each asset class in order to derive the equivalent

rating level for each transaction. This methodology is verified by the internal credit function as part of the approval process for each new transaction. The performance of each underlying asset portfolio, including residential and commercial mortgages and re-securitisations, is monitored to confirm that the applicable equivalent rating level still applies and is independently verified. Our IAA approach is audited periodically by Internal Audit and reviewed by the PRA.

There was \$0.5bn (2016: \$0.7bn) of unrealised losses on Asset-backed securities ('ABS') in the year, also disclosed on page 145 of the Annual Report and Accounts 2017, which fully relates to assets within SPEs that are consolidated for regulatory purposes.

Analysis of securitisation exposures

HSBC's involvement in securitisation activities reflects the following:

- securitisation positions are not backed by revolving exposures other than trade receivables in Regency Assets Limited, which is unchanged from 2016;

- facilities are not subject to early amortisation provisions (2016: nil);

- \$4.7bn positions held as synthetic transactions (2016: \$4.7bn);

- no assets awaiting securitisation (2016: nil);

- total exposures include off-balance sheet exposure of \$15.3bn (2016: \$15.1bn), mainly relating to contingent liquidity lines provided to securitisation vehicles where we act as sponsor, with a small amount from derivative exposures where we are an investor. The off-balance sheet exposures are held in the non-trading book and the exposure types are residential mortgages, commercial mortgages, trade receivables and re-securitisations; and

- no realised losses on securitisation asset disposals in the year (2016: nil).

Further details of our securitisation exposures may be found on page 145 of the Annual Report and Accounts 2017.

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Table 39: Securitisation exposure – movement in the year

| | Footnotes | Total at Movement in year | | | | Total at 31 Dec |
|--|-----------|---------------------------|--------------------|------------------------------|------------------|-----------------|
| | | 1 Jan \$bn | As originator \$bn | As sponsor ³ \$bn | As investor \$bn | |
| Aggregate amount of securitisation exposures | | | | | | |
| Residential mortgages | 1 | 3.0 | — | 0.2 | 0.6 | 3.8 |
| Commercial mortgages | 1 | 3.6 | — | 0.1 | (1.0) |)2.7 |
| Credit Cards | | — | — | — | 1.2 | 1.2 |
| Leasing | | — | — | 0.8 | 0.4 | 1.2 |
| Loans to corporates or SMEs | | 4.9 | — | 0.3 | (0.1) |)5.1 |
| Consumer loans | | 1.1 | — | 1.7 | 1.8 | 4.6 |
| Trade receivables | 2 | 17.3 | — | (1.0) | (0.1) |)16.2 |
| Other assets | | 0.8 | — | 0.4 | (0.2) |)1.0 |
| Re-securitisations | 1 | 7.0 | (0.5) | (4.4) | (0.3) |)1.8 |
| 2017 | | 37.7 | (0.5) | (1.9) |)2.3 | 37.6 |
| Aggregate amount of securitisation exposures | | | | | | |
| Residential mortgages | 1 | 3.2 | — | — | (0.1) |)3.1 |
| Commercial mortgages | 1 | 3.8 | — | — | (0.2) |)3.6 |
| Leasing | | 0.1 | — | — | (0.1) |)— |
| Loans to corporates or SMEs | | 6.2 | — | — | (1.3) |)4.9 |
| Consumer loans | | 0.5 | — | — | 0.6 | 1.1 |
| Trade receivables | 2 | 20.4 | — | (3.0) | (0.1) |)17.3 |
| Other assets | | 0.0 | — | — | 0.8 | 0.8 |
| Re-securitisations | 1 | 10.2 | (0.4) | (2.5) | (0.4) |)6.9 |
| 2016 | | 44.4 | (0.4) | (5.5) | (0.8) |)37.7 |

Residential and Commercial mortgages and re-securitisations principally include exposures to Solitaire Funding Limited, Mazarin Funding Limited, Barion Funding Limited and Malachite Funding Limited and restructured 1 on-balance sheet assets. The pools primarily comprise the senior tranches of retail mortgage backed securities, commercial mortgage backed securities, auto ABS, credit card ABS, student loans, collateralised debt obligations and also include bank subordinated debt.

2 Trade receivables largely relate to Regency Assets Limited and pools are senior with a maturity of less than 10 years.

3 The movements during 2017 are primarily attributable to a change in the presentation of overlapping exposures to Solitaire Funding Limited. Comparatives for 2016 have not been restated.

Table 40: Securitisation – asset values and impairments

| | Footnotes | 2017 | | Securitisation exposures impairment \$bn | 2016 | | Securitisation exposures impairment \$bn |
|--------------------------------|-----------|--------------------------------|----------------------------|--|--------------------------------|----------------------------|--|
| | | Underlying assets ¹ | | | Underlying assets ¹ | | |
| | | Total ³ \$bn | Impaired and past due \$bn | | Total \$bn | Impaired and past due \$bn | |
| As originator | | 5.8 | 0.5 | 0.2 | 6.3 | 1.2 | 0.4 |
| – loans to corporates and SMEs | | 5.0 | — | — | 5.0 | — | — |
| – re-securitisations | 2 | 0.8 | 0.5 | 0.2 | 1.3 | 1.2 | 0.4 |
| As sponsor | | 21.1 | 0.4 | 0.1 | 22.1 | 0.1 | 0.1 |
| – residential mortgages | | 0.3 | — | — | — | — | — |
| – commercial mortgages | | 0.1 | 0.1 | 0.1 | — | — | — |
| – leasing | | 0.8 | — | — | — | — | — |

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| | | | | | | | |
|--------------------------------|---|------|-----|-----|------|-----|-----|
| – loans to corporates and SMEs | | 0.3 | 0.3 | — | — | — | — |
| – consumer loans | | 1.9 | — | — | — | — | — |
| – trade receivables | | 16.2 | — | — | 16.5 | — | — |
| – re-securitisations | 2 | 1.0 | — | — | 5.6 | 0.1 | 0.1 |
| – other assets | | 0.5 | — | — | — | — | — |
| At 31 Dec | | 26.9 | 0.9 | 0.3 | 28.4 | 1.3 | 0.5 |

¹ Securitisation exposures may exceed the underlying asset values when HSBC provides liquidity facilities while also acting as derivative counterparty and a note holder in the SPE.

² The amount of underlying assets reported for re-securitisations denotes the value of collateral within the re-securitisation vehicles.

³ As originator and sponsor, all associated underlying assets are held in the non-trading book. These assets are all underlying to traditional securitisations with the exception of ‘loans to corporates and SMEs’, which is underlying to a synthetic securitisation.

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Market risk

Overview of market risk in global businesses

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

Exposure to market risk

Exposure to market risk is separated into two portfolios:

• Trading portfolios comprise positions arising from market-making.

• Non-trading portfolios comprise positions that primarily arise from the interest rate management of our retail and commercial banking assets and liabilities, financial investments designated as available-for-sale ('AFS') and held to maturity, and exposures arising from our insurance operations.

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

The nature of the hedging and risk mitigation strategies performed across the Group corresponds to the market risk management instruments available within each operating jurisdiction. These 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. For a discussion on hedging risk and monitoring the continuing effectiveness of hedges, refer to page 228 of the Annual Report and Accounts 2017.

The tables below reflect the components of capital requirement under the standardised approach table 41 and the internal model approach table 42 for market risk.

Table 41: Market risk under standardised approach

| | At 31 Dec | | |
|---|-----------|------|----------------------|
| | 2017 | 2016 | 2017 |
| | RWAs | RWAs | Capital requirements |
| | \$bn | \$bn | \$bn |
| Outright products | | | |
| 1 Interest rate risk (general and specific) | 2.2 | 1.5 | 0.2 |
| 2 Equity risk (general and specific) | 0.1 | 1.7 | — |
| 3 Foreign exchange risk | 0.2 | 0.3 | — |
| 4 Commodity risk | 0.1 | — | — |
| Options | | | |
| 5 Simplified approach | — | — | — |
| 6 Delta-plus method | — | — | — |
| 7 Scenario approach | — | — | — |
| 8 Securitisation | 1.8 | 1.5 | 0.1 |
| 9 Total | 4.4 | 5.0 | 0.3 |

Table 42: Market risk under IMA

| | At 31 Dec 2017 | |
|--|----------------|------------------|
| | RWAs | Capital required |
| | \$bn | \$bn |
| 1 VaR (higher of values a and b) | 8.3 | 0.7 |
| (a) Previous day's VaR | 0.1 | — |
| (b) Average daily VaR | 8.3 | 0.7 |
| 2 Stressed VaR (higher of values a and b) | 14.3 | 1.1 |
| (a) Latest SVaR | 0.1 | — |
| (b) Average SVaR | 14.3 | 1.1 |
| 3 Incremental risk charge (higher of values a and b) | 10.0 | 0.8 |
| (a) Most recent IRC value | 0.7 | 0.1 |

| | | |
|-----------------------|------|-----|
| (b) Average IRC value | 10.0 | 0.8 |
| 5 Other | 1.9 | 0.2 |
| 6 Total | 34.5 | 2.8 |

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Market risk governance

GB&M manages market risk, where the majority of the total VaR, SVaR and IRC of HSBC (excluding insurance) and almost all trading VaR resides, using risk limits approved by the GMB. For a discussion on market risk governance refer to page 115 of the Annual Report and Accounts 2017.

Market risk measures

Monitoring and limiting market risk exposures

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

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

Sensitivity analysis

We use sensitivity measures to monitor the market risk positions within each risk type. Sensitivity limits are set for portfolios, products and risk types, with the depth of the market being one of the principal factors in determining the level of limits set.

Value at risk

VaR is a technique that estimates the potential losses on risk positions in the trading portfolio 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 we capitalise those exposures.

Where there is not an approved internal model, we use the appropriate local rules to capitalise exposures locally.

In addition, we calculate VaR for non-trading portfolios to have a complete picture of risk. Our models are predominantly based on historical simulation. VaR is calculated at a 99% confidence level for a one-day holding period. Where we do not calculate VaR explicitly, we use alternative tools as described in the stress testing section below.

Our VaR models derive plausible future scenarios from past series of recorded market rates and prices, taking into account inter-relationships between different markets and rates such as interest rates and foreign exchange rates. Our models use a mixed approach when applying changes in market rates and prices:

- For equity, credit and foreign exchange risk factors, the potential movements are typically represented on a relative return basis.

- For interest rates, a mixed approach is used. Curve movements are typically absolute, whereas volatilities are on a relative return basis.

We use the past two years as the data set in our VaR models, which is updated on a fortnightly basis, and these scenarios are then applied to the market baselines and trading positions on a daily basis. The models also incorporate the effect of option features on the underlying exposures.

The valuation approach used in our models values:

- non-linear instruments using a full revaluation approach; and

- linear instruments, such as bonds and swaps, using a sensitivity based approach.

The nature of the VaR models means that an increase in observed market volatility will lead to an increase in VaR even 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 close of business and therefore does not necessarily reflect intra-day exposures.

Risk not in VaR framework

The Risks not in VaR ('RNIV') framework captures risks from exposures in the HSBC trading book which are not captured well by the VaR model. Our VaR model is designed to capture significant basis risk such as CDS versus bond, asset swap spreads and cross-currency basis. Other basis risks which are not completely covered in VaR, such as the London interbank offered rate ('Libor') tenor basis, are complemented by our RNIV calculations and are integrated into our capital framework.

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. The severity of the scenarios is calibrated to be in line with the capital adequacy requirements. The outcome of the VaR-based RNIV is included in the VaR calculation and back-testing; a stressed VaR RNIV is also computed for the risk factors considered in the VaR-based RNIV approach.

Stress-type RNIVs include a gap risk exposure measure to capture risk on non-recourse margin loans and a de-peg risk measure to capture risk to pegged and heavily managed currencies.

Back-testing

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

The actual number of profits or losses in excess of VaR over this period can therefore be used to gauge how well the models are performing.

We back-test VaR at various levels which reflect a full legal entity scope of HSBC, including entities that do not have local permission to use VaR for regulatory purposes. Back-testing using the regulatory hierarchy includes entities which have approval to use VaR in the calculation of market risk regulatory capital requirement.

HSBC submits separate back-testing results to regulators, including the PRA and the European Central Bank, based on applicable frequencies ranging from two business days after an exception occurs, to quarterly submissions.

In terms of the CRD IV rules, VaR back-testing loss, and not profit, exceptions count towards the multiplier determined by the PRA for the purposes of the capital requirement calculation for market risk. The multiplier does not get increased if there are less than five loss exceptions.

The graphs below show a one-year history for VaR back-testing exceptions against both actual and hypothetical profit and loss.

In 2017, the PRA VaR approved entities experienced exceptions against both actual and hypothetical profit and loss in December: a loss exception, driven by a margin loan; and a profit exception, driven by gains on Japanese yen cross currency swaps, and gains in strategic foreign exchange hedges.

There was no evidence of model errors or control failures.

The back-testing result excludes exceptions due from changes in fair value adjustments.

Comparison of VaR estimates with gains/losses

VaR back-testing exceptions against actual profit & loss (\$m)

Actual profit and loss VaR wBack-testing profit exception

VaR back-testing exceptions against hypothetical profit & loss (\$m)

Hypothetical profit and loss VaR wBack-testing profit exception

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Stress testing

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

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

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

Stressed VaR and stress testing, together with reverse stress testing and the management of gap risk, provide management with insights regarding the 'tail risk' beyond VaR, for which HSBC's appetite is limited.

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

During 2017 we devised and ran stress hypothetical scenarios to

specific events including the French election and a potential North Korea conflict.

Market risk capital models

There are a number of measures which HSBC has permission to use in calculating regulatory capital which are listed in table below. For regulatory purposes, the trading book comprises all positions in CRD financial instruments and commodities which 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. Trading book positions must either be free of any restrictive covenants on their tradability or be capable of being hedged.

A CRD financial instrument is defined as any contract that gives rise to both a financial asset to one party and a financial liability or equity instrument to another party.

HSBC maintains a trading book policy which defines the minimum requirements for trading book positions and the process for classifying positions as trading or non-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.

If any of the policy criteria are not met, then the position is categorised as a non-trading book exposure.

| Model component | Confidence level | Liquidity horizon | Model description and methodology |
|-----------------|------------------|-------------------|---|
| VaR | 99% | 10 day | Uses most recent two years' history of daily returns to determine a loss distribution. The result is scaled, using the square root of 10, from one day to provide an equivalent 10-day loss. |
| Stressed VaR | 99% | 10 day | Stressed VaR is calibrated to a one-year period of stress observed in history. |
| IRC | 99.9% | 1 year | Uses a multi-factor Gaussian Monte-Carlo simulation, which includes product basis, concentration, hedge mismatch, recovery rate and liquidity as part of the simulation process. A minimum liquidity horizon of three months is applied and is based on a combination of factors, including issuer type, currency and size of exposure. |
| Options | n/a | n/a | Uses a standard charge scenario approach based on a spot volatility grid where, for each point on the grid, there is a full revaluation of the portfolio. The regulators prescribe the ranges, therefore there is no equivalence with confidence level and liquidity horizon. |

¹ Non-proprietary details are available in the Financial Services Register on the PRA website.

Table 43: IMA values for trading portfolios

| | At 31 Dec | |
|---------------------------------|-----------|---------|
| | 2017 | 2016 |
| | \$m | \$m |
| VaR (10 day 99%) | | |
| 1 Maximum value | 319.1 | 327.1 |
| 2 Average value | 197.0 | 229.6 |
| 3 Minimum value | 163.7 | 186.4 |
| 4 Period end | 228.2 | 215.7 |
| Stressed VaR (10 day 99%) | | |
| 5 Maximum value | 439.7 | 454.0 |
| 6 Average value | 284.7 | 389.9 |
| 7 Minimum value | 193.3 | 269.7 |
| 8 Period end | 251.3 | 269.7 |
| Incremental Risk Charge (99.9%) | | |
| 9 Maximum value | 1,042.7 | 1,100.7 |
| 10 Average value | 828.5 | 787.0 |
| 11 Minimum value | 673.4 | 697.3 |
| 12 Period end | 803.4 | 705.6 |

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

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

The trading books which received approval from the regulator to be covered via an internal model are used to calculate VaR for regulatory purposes. Regulatory VaR levels contribute to the calculation of market risk RWAs. The regulatory VaR table is based on the regulatory permissions received, plus aggregated sites. This differs from the daily VaR reported in the Annual Report and Accounts which shows a fully diversified view used for internal risk management.

There were no material changes in the VaR used for regulatory purposes and this is in line with expectation.

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 as follows:

- potential market movements employed for stressed VaR calculations are based on a continuous one-year period of stress for the trading portfolio;

- the choice of period is based on the assessment at the Group level of the most volatile period in recent history and changed during 2017:

- from (July 2007 to July 2008) to (July 2012 to July 2013) in March 2017;

- to (April 2010 to April 2011) in June 2017; and

- to (May 2008 to May 2009) in September 2017;

- it is calculated to a 99% confidence using a 10-day holding period; and

- 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.

The decrease in stressed VaR was from the inclusion of new entities which are now consolidated, and with it increased diversification benefits. This approval was under Article 325 permission from the PRA and included Indonesia, Singapore and the Middle East.

Incremental risk charge

The IRC measures the default and migration risk of issuers of traded instruments.

IRC risk factors include credit migration, default, product basis, concentration, hedge mismatch, recovery rate and liquidity. The PDs are floored to reflect the lack of historical data on defaults and a period of stress is used to calibrate the spread changes for the relevant ratings. The IRC model is validated quarterly by stressing key model parameters and reviewing the response of the model.

The IRC is a stand-alone charge generating no diversification benefit with other charges. We do not use weighted averages for calculating the liquidity horizon for the IRC measure. IRC relies on a range of liquidity horizons from three months, corresponding to the regulatory floor, to one year. A wide range of criteria can indicate the liquidity of a position. The liquidity horizon for the IRC measure depends on a set of factors such as issuer features, including rating, sector, geography and size of positions, including product, maturity and concentration.

The IRC transition matrices are calibrated using transition and default data published by three rating agencies (Standard & Poor's, Moody's and Fitch) as the starting point, in combination with internal rules for flooring. The average of the three matrices is computed for each sector, ignoring zero transition probabilities. The PDs are then floored: sovereign PDs are consistent with IRB, while a 3bp floor is applied to corporates' and banks' PDs.

The IRC correlation matrix is derived from historical CDS spreads data, covering the latest two-year VaR period. The returns estimation window is set equal to either three or 12 months, depending on the liquidity horizon of each obligor. First, each obligor is mapped to six sector/rating categories; then the correlation matrix is obtained by computing the arithmetic mean of correlations for each category.

The increase in the period end IRC measure was driven from the loss of hedging benefit from short positions as their residual maturity fell below their corresponding liquidity horizons for recognition within the IRC measure.

Prudent valuation adjustment

HSBC 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. HSBC'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 ('CVA') and investing and funding costs ('FFVA').

Table 44: Prudential valuation adjustments

| Equity | Interest | FX | Credit | Commodities | Total | Of which: | Of which: |
|--------|----------|----|--------|-------------|-------|-----------|-----------|
| rates | | | | | | | |

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| | \$m | \$m | \$m | \$m | \$m | \$m | \$m | in the trading book | in the banking book | |
|-----------------------------|------|-------|-------|------|-----|----------|-------|------------------------|------------------------|---|
| | | | | | | | | | | |
| Closeout uncertainty | (200 |)(391 |)(32) | (182 |)(4 |)(809 |)(486 | |)(323 |) |
| – of which: | | | | | | | | | | |
| mid-market value | (111 |)(95 |)(7 |)(83 |)(3 |)(299 |)(135 | |)(164 |) |
| closeout cost | (19 |)(79 |)(7 |)(8 |)(1 |)(114 |)(101 | |)(13 |) |
| concentration | (70 |)(217 |)(18) | (91 |)— | (396 |)(250 | |)(146 |) |
| Early termination | — | — | — | (6 |)— | (6 |)(6 | |)— |) |
| Model risk | (30 |)(73 |)(5 |)(13 |)— | (121 |)(118 | |)(3 |) |
| Operational risk | (13 |)(24 |)(2 |)(13 |)(1 |)(53 |)(33 | |)(20 |) |
| Investing and funding costs | — | (72 |)— | (1 |)(1 |)(74 |)(74 | |)— |) |
| Unearned credit spreads | — | (62 |)(4 |)(7 |)(1 |)(74 |)(74 | |)— |) |
| Future administrative costs | — | (5 |)— | (4 |)— | (9 |)(9 | |)— |) |
| Other | — | — | — | — | — | — | — | | — |) |
| Total adjustment | (243 |)(627 |)(43) | (226 |)(7 |)(1,146) | (800 | |)(346 |) |

PVA has decreased by 16% over 2017. PVA movements were driven by: (i) changes of exposure resulting from either new trades/unwinds including the disposal of some ABS legacy exposures, or risk profiles modification due to market movements; (ii) the reduction of observed price dispersion in line with spreads tightening and lower levels of market volatility; (iii) refinements in PVA methodologies reflecting the evolution of market modelling and pricing practices, notably in terms of CVA uncertainty

measurement and prudent exit cost of concentrated positions; (iv) the evolution of market infrastructure, notably in terms of market and trade data availability, enabling better price uncertainty measurements; (v) changes in CVA accounting fair value adjustment methodologies which resulted in related additional valuation adjustments; and (vi) position transfer between fair valued and accrued only books.

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Structural foreign exchange exposures

Structural foreign exchange exposures represent net investments in subsidiaries, branches and associates whose functional currency is not the US dollar. An entity's functional currency is normally that of the primary economic environment in which it operates.

Exchange differences on structural exposures are recognised in 'Other comprehensive income'. We use the US dollar as our presentation currency in our consolidated financial statements because the US dollar and currencies linked to it form the major currency bloc in which we transact and fund our business.

Our consolidated balance sheet is, therefore, affected by exchange differences between the US dollar and all the non-US dollar functional currencies of underlying subsidiaries.

Our structural foreign exchange exposures are managed with the primary objective of ensuring, where practical, that our consolidated capital ratios and the capital ratios of individual banking subsidiaries are largely protected from the effect of changes in exchange rates. We hedge structural foreign exchange exposures only in limited circumstances. Details of our structural foreign exchange exposures are provided in the Market risk section, on page 152 of the Annual Report and Accounts 2017.

Interest rate risk in the banking book

Interest rate risk in the banking book ('IRRBB') is the potential adverse impact of changes in interest rates on earnings and capital. The component of IRRBB that can be economically neutralised in the market is transferred to BSM to manage, in accordance with internal transfer pricing rules. In its management of IRRBB, the Group aims to balance mitigating the effect of future interest rate movements which could reduce net interest income against the cost of hedging. The monitoring of the projected net

interest income and economic value of equity ('EVE') sensitivity under varying interest rate scenarios is a key part of this.

EVE represents the present value of the future banking book cash flows that could be distributed to equity providers under a managed run-off scenario, i.e. the current book value of equity plus the present value of future net interest income in this scenario. An EVE sensitivity is the extent to which the EVE will change due to a pre-specified movements in interest rates, where all other economic variables are held constant.

More details on our IRRBB may be found on page 116 of the Annual Report and Accounts 2017.

Operational risk

Overview and objectives

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

Operational risk is relevant to every aspect of our business. It covers a wide spectrum of issues, in particular legal, compliance, security and fraud. Losses arising from breaches of regulation and law, unauthorised activities, error, omission, inefficiency, fraud, systems failure or external events all fall within the definition of operational risk.

We have historically experienced operational risk losses in the following major categories:

- mis-selling of payment protection insurance;
- external criminal activities, including fraud;
- breakdowns in processes/procedures due to human error, misjudgement or malice;
- system failure or non-availability; and
- breach of regulatory and/or legislative requirements.

Table 45: Operational risk RWAs

| | 2017 | | 2016 | |
|--------------------------------------|--------------|-----------------------------|--------------|-----------------------------|
| | RWAs \$bn | Capital required \$bn | RWAs \$bn | Capital required \$bn |
| By global business | | | | |
| Retail Banking and Wealth Management | 27.2 | 2.2 | 30.5 | 2.4 |

| | | | | |
|------------------------------|------|-----|------|-----|
| Commercial Banking | 23.7 | 1.9 | 25.3 | 2.0 |
| Global Banking and Markets | 30.9 | 2.5 | 32.0 | 2.6 |
| Global Private Banking | 2.8 | 0.2 | 2.9 | 0.2 |
| Corporate Centre | 8.1 | 0.6 | 7.3 | 0.6 |
| At 31 Dec | 92.7 | 7.4 | 98.0 | 7.8 |
| By geographical region | | | | |
| Europe | 29.0 | 2.3 | 30.9 | 2.5 |
| Asia | 37.1 | 3.0 | 36.6 | 2.9 |
| Middle East and North Africa | 7.0 | 0.5 | 7.5 | 0.6 |
| North America | 12.1 | 1.0 | 12.8 | 1.0 |
| Latin America | 7.5 | 0.6 | 10.2 | 0.8 |
| At 31 Dec | 92.7 | 7.4 | 98.0 | 7.8 |

Requirements under CRD IV include a capital requirement for operational risk, utilising three levels of sophistication as stated on page 17. We have historically adopted, and currently use, the standardised approach in determining our operational risk capital requirements. Table 45 sets out our operational risk capital requirements by region and global businesses. We use an operational risk model for economic capital calculation purposes.

During 2017, our operational risk profile continued to be dominated by compliance risks as referred to in the 'Top and emerging risks' section on page 95 of the Annual Report and Accounts 2017 and in the 'Regulatory compliance risk management' section on page 117 of the Annual Report and Accounts 2017. Operational risk losses in 2017 are lower than in 2016, reflecting a reduction in losses incurred relating to large

legacy conduct-related events. Conduct-related costs included in significant items are outlined on page 61 of the Annual Report and Accounts 2017.

The regulatory environment in which we operate is increasing the cost of doing business and could reduce our future profitability. In 2017 we continued our ongoing work to strengthen those controls that manage our most material risks. We further developed controls to help ensure that we know our customers, ask the right questions, monitor transactions and escalate concerns to detect, prevent and deter financial crime risk.

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We recognise that operational risk losses can be incurred for a wide variety of reasons, including rare but extreme events.

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

Organisation and responsibilities

Responsibility for managing operational risk lies with HSBC's employees. During 2017 we implemented a new operational risk management framework ('ORMF') and Group-wide risk management system. The new ORMF provides an end-to-end view of the non-financial risks, enhancing focus on the risks that matter the most and associated controls. It provides a platform to drive forward-looking risk awareness and assist management focus. It also helps the organisation understand the level of risk it is willing to accept.

Activity to strengthen our risk culture and better embed the use of the new ORMF, particularly the three lines of defence model, was a key focus in 2017.

The first line of defence owns the risk and is responsible for identifying, recording, reporting, managing the risks and ensuring that the right controls and assessments are in place to mitigate these risks. The second line of defence sets the policy and guidelines for managing the risks and provides advice, guidance and challenge to the first line of defence on effective risk management. The third line of defence is Internal Audit which independently ensures we are managing risk effectively.

More details on our ORMF may be found on page 117 of the Annual Report and Accounts 2017.

The Global Operational Risk Committee, which is a sub-committee of the GRMM, meets monthly to discuss key risk issues and review the effective implementation of the ORMF.

Operational risk is organised as a specific risk discipline within Global Risk. The Group Head of Operational Risk is responsible for establishing and maintaining the ORMF, monitoring the level of operational losses and the effectiveness of the internal control environment supported by their second line of defence functions. The Group Head of Operational Risk is accountable to the Group Chief Risk Officer in respect of this element of the overall enterprise-wide, risk management framework.

Measurement and monitoring

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

Monitoring operational risk exposure against risk appetite on a regular basis, and setting out our risk acceptance process, drives

risk awareness in a more forward-looking manner. It assists management in determining whether further action is required.

Risk scenario analysis across material legal entities provides a top down, forward-looking assessment of risks to help determine whether they are being effectively managed within our risk appetite or whether further management action is required.

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

Operational risk and control assessment approach

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

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

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

Recording

We use a Group-wide risk management system to record the results of our operational risk management process. Operational risk and control assessments, as described above, are input and maintained by business units. Business management monitor and follow up the progress of documented action plans.

Operational risk loss reporting

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

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Other risks

Pension risk

We operate a number of pension plans throughout the world for our employees. Our plans are either defined benefit or defined contribution plans, which expose the Group to different types of risks. We have a global pension risk management framework and

accompanying global policies on the management of these risks, which is overseen by the Global Pensions Oversight Forum.

Details of our management of pension risk may be found in 'Pension risk management' on page 120 of the Annual Report and Accounts 2017.

Non-trading book exposures in equities

At 31 December 2017, we had equity investments in the non-trading book of \$4.2bn (2016: \$4.9bn). These consist of investments held for the purposes shown in table 46.

Table 46: Non-trading book equity investments

| | 2017 | | 2016 | | | |
|----------------------------|--------------------|--------------------------|-------|--------------------|--------------------------|-------|
| | Available for sale | Designated at fair value | Total | Available for sale | Designated at fair value | Total |
| | Footnote \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Strategic investments | 1.3 | — | 1.3 | 2.0 | — | 2.0 |
| Private equity investments | 1.0 | 0.3 | 1.3 | 1.2 | 0.2 | 1.4 |
| Business facilitation | 1 | 1.6 | 1.6 | 1.5 | — | 1.5 |
| At 31 Dec | | 3.9 | 4.2 | 4.7 | 0.2 | 4.9 |

1 Includes holdings in government-sponsored enterprises and local stock exchanges.

We make investments in private equity primarily through managed funds that are subject to limits on the amount of investment. We risk-assess these commitments to ensure that industry and geographical concentrations remain within acceptable levels for the portfolio as a whole, and perform regular reviews to substantiate the valuation of the investments within the portfolio.

Exchange traded investments amounted to \$0.7bn (2016: \$0.9bn), with the remainder being unlisted. These investments are held at fair value in line with market prices and are mainly strategic in nature. The decrease in strategic investment equities was largely due to disposals of a number of investments.

On a regulatory consolidation basis, the net gain from disposal of equity securities amounted to \$0.8bn (2016: \$1.1bn), while impairment of AFS equities amounted to \$0.1bn (2016: \$0.0bn). Unrealised gains on equities of \$0.9bn at 31 December 2017 were fully recognised in CET1.

Details of our accounting policy for AFS equity investments and the valuation of financial instruments may be found on page 191 of the Annual Report and Accounts 2017. A detailed description of the valuation techniques applied to private equity may be found on page 246 of the Annual Report and Accounts 2017.

Risk management of insurance operations

We operate an integrated bancassurance model that provides insurance products principally for customers with whom we have a banking relationship.

The insurance contracts we sell relate to the underlying needs of our banking customers, which we can identify from our point-of-sale contacts and customer knowledge. The majority of sales are of savings and investment products and term and credit life contracts.

By focusing largely on personal and small- and medium-sized enterprises ('SMEs') lines of business, we are able to optimise volumes and diversify individual insurance risks.

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

We have life insurance manufacturing subsidiaries in nine countries (Argentina, mainland China, France, Hong Kong, Malaysia, Malta, Mexico, Singapore and the UK). We also have a life insurance manufacturing associate in India.

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

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

The risk profile of our insurance manufacturing businesses is measured using an economic capital approach. Assets and liabilities are measured on a market value basis, and a capital requirement is defined to ensure that there is a less than one-in-200 chance of insolvency over a one-year time horizon, given the risks to which the businesses are exposed. The methodology for the economic capital calculation is largely aligned to the pan-European Solvency II insurance capital regulations.

Subsidiaries engaged in insurance activities are excluded from the regulatory consolidation by excluding assets, liabilities and post-acquisition reserves, leaving the investment of these insurance subsidiaries to be recorded at cost and deducted from CET1 subject to thresholds (amounts below the thresholds are risk-weighted).

Further details of the management of financial risks and insurance risk arising from the insurance operations are provided from page 118 of the Annual Report and Accounts 2017.

Liquidity and funding risk

Strategies and processes in the management of liquidity risk

HSBC has an internal liquidity and funding risk management framework ('LFRF') which aims to allow it to withstand very severe liquidity stresses. It is designed to be adaptable to changing business models, markets and regulations. The management of liquidity and funding is primarily undertaken locally (by country) in our operating entities in compliance with the Group's LFRF, and with practices and limits set by the GMB through the RMM and approved by the Board. Our general policy is that each defined operating entity should be self-sufficient in funding its own activities.

Structure and organisation of the liquidity risk management function

The Group Treasurer, who reports to the Group Finance Director, has responsibility for the oversight of the LFRF. Asset, Liability and Capital Management ('ALCM') teams are responsible for the application of the LFRF at a local operating entity level.

The elements of the LFRF are underpinned by a robust governance framework, the two major elements of which are: Group, regional and entity level asset and liability management committees ('ALCOs')

Annual internal liquidity adequacy assessment process ('ILAAP') used to validate risk tolerance and set risk appetite
Liquidity and funding are predominantly managed at a country level. Where appropriate, management may be expanded to cover a consolidated group of legal entities or narrowed to a principal office (branch) of a wider legal entity to reflect the management under internal or regulatory definitions.

The RMM reviews and agrees annually the list of countries, legal entities or consolidated groups it directly oversees and the composition of these entities ('principal operating entities'). This list forms the basis of liquidity and funding risk disclosures.

Group Treasury/Asset, Liability and Capital Management

The Group Treasury team is responsible for setting the Group's policy, proposing risk tolerance and providing review and challenge of the operating entities implementation. Regional and local ALCM teams are responsible for the implementation of group wide and local regulatory policy at a legal entity level.

Balance Sheet Management

Along with the Group's Global Business Lines, the Balance Sheet Management ('BSM') teams form the first line of defence in the management of liquidity risk, ensuring continuous compliance with the firm's risk appetite operating within their risk mandates.

Scope and nature of liquidity risk reporting and measurement

Where possible, the Group maintains standardised platforms utilising common data feeds in order to ensure consistency of standard internal and regulatory reporting and flexibility to deliver ad hoc requests.

Hedging and mitigating liquidity risk at HSBC

Management of liquidity and funding risk

Liquidity coverage ratio

The Liquidity Coverage Ratio ('LCR') aims to ensure that a bank has sufficient unencumbered high-quality liquid assets ('HQLA') to meet its liquidity needs in a 30 calendar day liquidity stress scenario. For the calculation of the LCR, HSBC follows the guidelines set by the European Commission.

The HSBC application of the LCR metric involves the following two key assumptions about the definition of operational deposits and the ability to transfer liquidity from non-EU legal entities:

we define operational deposits as transactional (current) accounts arising from the provision of custody services by HSBC Security Services or Global Liquidity and Cash Management, where the operational component is assessed to be the lower of the current balance and the separate notional values of debits and credits across the account in the previous calculation period; and

we assume no transferability of liquidity from non-EU entities other than to the extent currently permitted.

Net stable funding ratio

HSBC uses the NSFR as a basis for establishing stable funding around the Group. The NSFR requires institutions to maintain sufficient stable funding and reflects a bank's long-term funding profile (funding with a term of more than one year).

Liquid assets of HSBC's principal operating entities

Liquid assets are held and managed on a stand-alone operating entity basis. Most are held directly by each operating entity's BSM department, primarily for the purpose of managing liquidity risk in line with the LFRF.

The liquid asset buffer may also include securities in held-to-maturity portfolios. To qualify as part of the liquid asset buffer, held-to-maturity portfolios must have a deep and liquid repo market in the underlying security. Liquid assets also include any unencumbered liquid assets held outside BSM departments for any other purpose. The LFRF gives ultimate control of all unencumbered assets and sources of liquidity to BSM.

Overall adequacy of liquidity risk management at HSBC

All operating entities are required to manage liquidity risk and funding risks on a standalone basis in accordance with the LFRF, which includes the preparation of an Internal Liquidity Adequacy Assessment (ILAA) document, in order to ensure that:

- liquidity resources are adequate, both as to the amount and quality;
- there is no significant risk that liabilities cannot be met as they fall due;
- a prudent structural funding profile is maintained;
- adequate liquidity resources continue to be maintained; and
- the operating entity's liquidity risk framework is adequate and robust.

The key objectives of the ILAA process are to:

1. demonstrate that all material liquidity and funding risks are captured within the internal framework;
2. validate the operating entity's risk tolerance/appetite by demonstrating that reverse stress testing scenarios are acceptably remote and vulnerabilities have been assessed through the use of severe stress scenarios; and
3. provide review and challenge of the operating entity's ILAAP.

The final conclusion of the Group ILAAP, approved by the Board of Directors, is that each operating entity:

- maintains liquidity resources which are adequate in both amount and quality at all times, and ensures that there is no significant risk that its liabilities cannot be met as they fall due; and
- ensures its liquidity resources contain an adequate amount of HQLA and maintains a prudent funding profile.

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HSBC's business strategy and overall liquidity risk profile

The key aspects of the internal Liquidity and Funding Risk Framework which is used to ensure that HSBC maintains an appropriate overall liquidity risk profile are:

- stand-alone management of liquidity and funding by operating entity;
- operating entity classification by inherent liquidity risk ('ILR') categorisation;
- minimum LCR requirement depending on ILR categorisation;
- minimum NSFR requirement depending on ILR categorisation;
- legal entity depositor concentration limit;
- three-month and 12-month cumulative rolling term contractual maturity limits covering deposits from banks, deposits from non-bank financial institutions and securities issued;
- annual individual liquidity adequacy assessment by principal operating entity;
- minimum LCR requirement by currency;
- intra-day liquidity;
- liquidity funds transfer pricing; and
- forward-looking funding assessments.

The internal LFRF and the risk tolerance limits were approved by the RMM and the Board on the basis of recommendations made by the Group Risk Committee.

Concentration of funding and liquidity sources

Depositor concentration and term funding maturity concentration

The LCR and NSFR metrics assume a stressed outflow based on a portfolio of depositors within retail, corporate and financial deposit segments. The validity of these assumptions is challenged if the portfolio of depositors is not large enough to avoid depositor concentration.

Operating entities are exposed to term re-financing concentration risk if the current maturity profile results in future maturities being overly concentrated in any defined period.

At 31 December 2017, all principal operating entities were within the risk tolerance levels set for depositor concentration and term funding maturity concentration. These risk tolerances were established by the Board and are applicable under the LFRF.

Currency mismatch in the LCR

In times of stress it cannot automatically be assumed that one currency can always be converted for another, even if those currencies are 'hard' currencies. LCR must therefore be assessed by currency, if the currency is material.

In some currencies, convertibility is restricted by regulators and central banks and this restriction results in local currency not being convertible offshore or even onshore.

In the vast majority of cases, the only way to convert currencies for funding purposes is via deliverable foreign exchange (FX) swaps and, to a lesser extent, cross-currency repo. Access to FX Swaps markets can be impacted by both market wide stress and idiosyncratic stress. Idiosyncratic stress arises from the fact that settlement of the two currency legs occurs at different times during the day, exposing the counterparty who has to settle (pay) first to intra-day credit risk on the entire principal amount, until the other counterparty pays the other currency; this is often referred to as 'Herstatt Risk'.

The Group's internal liquidity and funding risk management framework requires all operating entities to monitor single currency LCR. Limits are set in consultation with Group Treasury and approved by Group Treasury before being approved by local ALCO.

Liquidity management across HSBC

The structure of the Group means that liquidity and funding risk cannot practically be managed on a consolidated group basis and can only be managed by entity on a standalone basis. The Group's liquidity and funding risk framework requires all operating entities to manage liquidity and funding risk on a standalone basis in accordance with the Group's liquidity and funding risk management framework and the liquidity and funding risk tolerances set out in the Group RAS.

The Group's internal liquidity and funding risk management framework does not therefore seek to manage liquidity and funding risk on a consolidated basis, other than to ensure that the position of the consolidated group meets the minimum regulatory requirements.

Liquid assets of HSBC's principal operating entities

The unweighted liquidity value of assets categorised as liquid for HSBC's principal operating entities is shown on page 102 of the Annual Report and Accounts 2017. This information is used for the purposes of calculating the LCR metric for the Group for which the weighted value of assets is shown in the table on the following page. This reflects the stock of unencumbered liquid assets at the reporting date, using the regulatory definition of liquid assets. The amount recognised by entity at the Group level is different from the amount recognised at a solo entity level, reflecting where liquidity cannot be freely transferred across HSBC.

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Table 47: Level and components of HSBC Group Consolidated Liquidity Coverage Ratio

| | Quarter ended 31 Dec 2017 | | Quarter ended 30 Sep 2017 | | Quarter ended 30 Jun 2017 | | Quarter ended 31 Mar 2017 | |
|---|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|
| | Total unweighted value \$m | Total weighted value \$m | Total unweighted value \$m | Total weighted value \$m | Total unweighted value \$m | Total weighted value \$m | Total unweighted value \$m | Total weighted value \$m |
| Number of data points used in the calculation of averages | 3 | | 3 | | 3 | | 3 | |
| High quality liquid assets | | | | | | | | |
| Total high quality liquid assets ('HQLA') | | 517,539 | | 491,993 | | 461,074 | | 440,755 |
| Cash outflows | | | | | | | | |
| Retail deposits and small business funding | 735,610 | 76,538 | 728,622 | 78,081 | 707,290 | 76,109 | 690,079 | 75,019 |
| – of which: | | | | | | | | |
| stable deposits | 282,723 | 13,976 | 234,705 | 11,566 | 231,742 | 11,433 | 221,561 | 10,924 |
| less stable deposits | 452,723 | 13,976 | 493,789 | 66,471 | 475,426 | 64,628 | 468,421 | 64,059 |
| Unsecured wholesale funding | 604,978 | 284,915 | 575,907 | 279,390 | 536,702 | 259,791 | 529,712 | 257,435 |
| – operational deposits (all counterparties) and deposits in networks of cooperative banks | 185,044 | 44,247 | 171,692 | 41,716 | 154,851 | 37,621 | 150,995 | 36,679 |
| – non-operational deposits (all counterparties) | 406,011 | 226,745 | 391,621 | 225,080 | 370,645 | 210,964 | 366,668 | 208,707 |
| – unsecured debt | 13,923 | 13,923 | 12,594 | 12,594 | 11,206 | 11,206 | 12,049 | 12,049 |
| Secured wholesale funding | | 14,241 | | 10,459 | | 10,355 | | 9,122 |
| Additional requirements | 298,207 | 89,605 | 296,919 | 91,164 | 285,983 | 85,095 | 274,957 | 76,835 |
| – outflows related to derivative exposures and other collateral requirements | 43,816 | 42,518 | 43,647 | 42,842 | 39,769 | 39,369 | 31,952 | 31,719 |
| – outflows related to loss of funding on debt products | — | — | — | — | — | — | — | — |
| – credit and liquidity facilities | 254,391 | 47,087 | 253,272 | 48,322 | 246,214 | 45,726 | 243,005 | 45,116 |
| Other contractual funding obligations | 92,239 | 40,551 | 79,111 | 41,054 | 66,281 | 30,465 | 71,119 | 36,993 |

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| | | | | | | | | |
|--|---------|---------|---------|---------|---------|---------|---------|---------|
| Other contingent funding obligations | 358,034 | 12,850 | 348,084 | 12,921 | 316,534 | 10,898 | 274,248 | 9,729 |
| Total cash outflows | | 518,700 | | 513,069 | | 472,713 | | 465,133 |
| Cash inflows | | | | | | | | |
| Secured lending transactions (including reverse repos) | 253,643 | 42,238 | 234,393 | 31,476 | 240,805 | 30,045 | 221,491 | 25,522 |
| Inflows from fully performing exposures | 111,306 | 81,653 | 104,485 | 78,836 | 98,880 | 74,419 | 96,923 | 73,592 |
| Other cash inflows (Difference between total weighted inflows and total weighted outflows arising from transactions in third countries where there are transfer restrictions or which are denominated in non-convertible currencies) | 77,731 | 46,905 | 83,233 | 51,245 | 72,131 | 42,282 | 70,609 | 45,226 |
| (Excess inflows from a related specialised credit institution) | | — | | — | | — | | — |
| Total cash inflows | 442,680 | 170,796 | 422,111 | 161,557 | 411,816 | 146,746 | 389,023 | 144,340 |
| Fully exempt inflows | — | — | — | — | — | — | — | — |
| Inflows Subject to 90% Cap | — | — | — | — | — | — | — | — |
| Inflows Subject to 75% Cap | 412,897 | 170,796 | 416,462 | 161,557 | 406,669 | 146,746 | 384,822 | 144,340 |
| Liquidity coverage ratio (Adjusted value) | | | | | | | | |
| Liquidity Buffer | | 517,539 | | 491,993 | | 461,074 | | 440,755 |
| Total net cash outflows | | 347,904 | | 351,512 | | 325,967 | | 320,793 |
| Liquidity coverage ratio (%) | | 148.8% | | 140.0% | | 141.5% | | 137.4% |

Analysis of on-balance sheet encumbered and unencumbered assets and off-balance sheet collateral

On-balance sheet encumbered and unencumbered assets

The following table, summarises the total on-balance sheet assets capable of supporting future funding and collateral needs, and shows the extent to which they are currently pledged for this purpose. This disclosure aims to facilitate an understanding of available and unrestricted assets that could be used to support potential future funding and collateral needs.

Under 'Off-balance sheet collateral' below we discuss the off-balance sheet collateral received and re-pledged, and the level of available unencumbered off-balance sheet collateral.

Off-balance sheet collateral

The fair value of assets accepted as collateral that we are permitted to sell or repledge in the absence of default was \$409bn at 31 December 2017 (2016: \$269bn). The fair value of any such collateral actually sold or repledged was \$242bn (2016: \$157bn). We are obliged to return equivalent securities. These transactions are conducted under terms that are usual and customary to standard reverse repo, stock borrowing and derivative transactions.

The fair value of collateral received and re-pledged in relation to reverse repos, stock borrowing and derivatives is reported on a gross basis. The related balance sheet receivables and payables are reported on a net basis where required under IFRS offset criteria. As a consequence of reverse repo, stock borrowing and derivative transactions where the collateral received could be sold or re-pledged but had not been, we held \$166bn (2016: \$112bn) of unencumbered collateral available to support potential future funding and collateral needs at 31 December 2017. Under the terms of our current collateral obligations under derivative contracts (which are ISDA compliant CSA contracts and contracts entered into for pension obligations), and based on an estimate of the positions at 31 December 2017, we calculate that we could be required to post additional collateral of up to \$0.3bn (2016: \$0.3bn) in the event of a one-notch downgrade in third-party agencies' credit rating of HSBC's debt. This would increase to \$0.5bn (2016: \$0.8bn) in the event of a two-notch downgrade.

For further details on liquidity and funding risk management, see page 113 onwards of the Annual Report and Accounts 2017.

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Table 48: Analysis of on-balance sheet encumbered and unencumbered assets

| | Assets encumbered as a result of transactions with counterparties other than central banks | | | Assets positioned at central banks (i.e. pre-positioned plus encumbered) | Unencumbered assets not positioned at central banks | | | Reverse repos/stock borrowing receivables and derivative assets | Assets that cannot be encumbered | Total |
|--|--|--------------------------------|--------|--|---|--|--------|---|----------------------------------|-------|
| | As a result of covered bonds | As a result of securitisations | Other | | Assets readily available for encumbrance | Other assets capable of being encumbered | | | | |
| | \$m | \$m | \$m | \$m | \$m | \$m | \$m | \$m | \$m | |
| Cash and balances at central banks | — | — | 7 | 128 | 172,567 | 206 | — | 7,716 | 180,624 | |
| Items in the course of collection from other banks | — | — | — | — | — | — | — | 6,628 | 6,628 | |
| Hong Kong Government certificates of indebtedness | — | — | — | — | — | — | — | 34,186 | 34,186 | |
| Trading assets | — | — | 93,867 | 4,630 | 143,811 | 10,234 | 17,120 | 18,333 | 287,995 | |
| – treasury and other eligible bills | — | — | 2,017 | 4,210 | 11,233 | 71 | — | 2 | 17,533 | |
| – debt securities | — | — | 36,367 | 420 | 69,934 | 657 | — | 108 | 107,486 | |
| – equity securities | — | — | 33,209 | — | 62,644 | 3,407 | — | — | 99,260 | |
| – loans and advances to banks | — | — | 8,215 | — | — | 2,430 | 7,611 | 7,799 | 26,055 | |
| – loans and advances to customers | — | — | 14,059 | — | — | 3,669 | 9,509 | 10,424 | 37,661 | |
| Financial assets designated at fair value | — | — | — | — | 1,331 | 64 | — | 28,069 | 29,464 | |
| – treasury and other eligible bills | — | — | — | — | 540 | — | — | 65 | 605 | |
| | — | — | — | — | 447 | — | — | 3,644 | 4,091 | |

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| | | | | | | | | | | |
|---|-------|-------|---------|---------|---------|---------|---------|---------|-----------|--|
| – debt securities | | | | | | | | | | |
| – equity securities | — | — | — | — | 344 | 64 | — | 24,352 | 24,760 | |
| – loans and advances to banks and customers | — | — | — | — | — | — | — | 8 | 8 | |
| Derivatives | — | — | — | — | — | — | 219,818 | — | 219,818 | |
| Loans and advances to banks | — | — | 3,599 | 5,699 | 1,906 | 56,542 | 1,160 | 21,487 | 90,393 | |
| Loans and advances to customers | 4,990 | 8,296 | 7,851 | 69,768 | 11,923 | 834,177 | 3,719 | 22,240 | 962,964 | |
| Reverse repurchase agreements – non-trading | — | — | — | — | — | — | 201,553 | — | 201,553 | |
| Financial investments – treasury and other eligible bills | — | 44 | 26,772 | 22,285 | 264,587 | 8,815 | — | 66,573 | 389,076 | |
| – debt securities | — | 44 | 26,457 | 18,437 | 190,119 | 5,951 | — | 65,300 | 306,308 | |
| – equity securities | — | — | — | — | 1,370 | 1,567 | — | 981 | 3,918 | |
| Prepayments, accrued income and other assets | — | — | 2,876 | — | 5,527 | 25,647 | — | 33,141 | 67,191 | |
| Current tax assets | — | — | — | — | — | — | — | 1,006 | 1,006 | |
| Interest in associates and joint ventures | — | — | 310 | — | 55 | 22,101 | — | 278 | 22,744 | |
| Goodwill and intangible assets | — | — | — | — | — | — | — | 23,453 | 23,453 | |
| Deferred tax | — | — | — | — | — | — | — | 4,676 | 4,676 | |
| At 31 Dec 2017 | 4,990 | 8,340 | 135,282 | 102,510 | 601,707 | 957,786 | 443,370 | 267,786 | 2,521,771 | |

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Table 48: Analysis of on-balance sheet encumbered and unencumbered assets (continued)

| | Assets encumbered as a result of transactions with counterparties other than central banks | | | Assets positioned at central banks (i.e. pre-positioned plus encumbered) | Unencumbered assets not positioned at central banks | | | Reverse repos/stock borrowing receivables and derivative assets | Assets that cannot be encumbered | Total |
|--|--|--------------------------------|--------|--|---|--|--------|---|----------------------------------|-------|
| | As a result of covered bonds | As a result of securitisations | Other | | Assets readily available for encumbrance | Other assets capable of being encumbered | | | | |
| | \$m | \$m | \$m | \$m | \$m | \$m | \$m | \$m | \$m | |
| Cash and balances at central banks | — | — | 10 | 82 | 123,363 | 326 | — | 4,228 | 128,009 | |
| Items in the course of collection from other banks | — | — | — | — | — | — | — | 5,003 | 5,003 | |
| Hong Kong Government certificates of indebtedness | — | — | — | — | — | — | — | 31,228 | 31,228 | |
| Trading assets | — | — | 62,962 | 2,504 | 131,420 | 7,419 | 10,207 | 20,613 | 235,125 | |
| – treasury and other eligible bills | — | — | 981 | 2,150 | 11,309 | 11 | — | — | 14,451 | |
| – debt securities | — | — | 34,144 | 354 | 59,231 | 318 | — | 7 | 94,054 | |
| – equity securities | — | — | 2,645 | — | 59,394 | 1,565 | — | — | 63,604 | |
| – loans and advances to banks | — | — | 10,532 | — | 1,331 | 1,910 | 5,386 | 5,610 | 24,769 | |
| – loans and advances to customers | — | — | 14,660 | 0 | 155 | 3,615 | 4,821 | 14,996 | 38,247 | |
| Financial assets designated at fair value | — | — | — | — | 835 | 20 | — | 23,901 | 24,756 | |
| – treasury and other eligible bills | — | — | — | — | 150 | — | — | 54 | 204 | |
| – debt securities | — | — | — | — | 442 | 0 | — | 3,747 | 4,189 | |

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| | | | | | | | | | |
|---|-------|-------|--------|--------|---------|---------|---------|---------|-----------|
| – equity securities | — | — | — | — | 243 | 20 | — | 20,021 | 20,284 |
| – loans and advances to banks and customers | — | — | — | — | 0 | — | — | 79 | 79 |
| Derivatives | — | — | — | — | — | — | 290,872 | — | 290,872 |
| Loans and advances to banks | — | 1 | 3,903 | 6,719 | 2,051 | 50,824 | 2,045 | 22,583 | 88,126 |
| Loans and advances to customers | 6,258 | 8,365 | 10,425 | 67,208 | 15,941 | 732,242 | 4,027 | 17,038 | 861,504 |
| Reverse repurchase agreements – non-trading | — | — | — | — | — | — | 160,974 | — | 160,974 |
| Financial investments – treasury and other eligible bills | — | — | 16,537 | 17,983 | 331,154 | 10,765 | — | 60,358 | 436,797 |
| – debt securities | — | — | 16,000 | 14,217 | 236,003 | 7,904 | — | 58,780 | 332,904 |
| – equity securities | — | — | 0 | — | 1,585 | 1,718 | — | 1,364 | 4,667 |
| Prepayments, accrued income and other assets | — | — | 2,358 | — | 8,368 | 27,099 | — | 26,084 | 63,909 |
| Current tax assets | — | — | — | — | — | — | — | 1,145 | 1,145 |
| Interest in associates and joint ventures | — | — | 345 | — | 62 | 19,329 | — | 293 | 20,029 |
| Goodwill and intangible assets | — | — | — | — | — | — | — | 21,346 | 21,346 |
| Deferred tax | — | — | — | — | — | — | — | 6,163 | 6,163 |
| At 31 Dec 2016 | 6,258 | 8,366 | 96,540 | 94,496 | 613,194 | 848,024 | 468,125 | 239,983 | 2,374,986 |

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Reputational risk

Reputational risk is the risk of failing to meet stakeholder expectations as a result of any event, behaviour, action or inaction, either by HSBC, our employees or those with whom we are associated. This might cause stakeholders to form a negative view of the Group and result in financial or non-financial effects or loss of confidence in the Group. Reputational risk relates to stakeholders' perceptions, whether fact-based or otherwise. Stakeholders' expectations change constantly and so reputational risk is dynamic and varies between geographical regions, groups and individuals. We have an unwavering commitment to operating at the high standards we set for ourselves in every jurisdiction. Any material lapse in standards of integrity, compliance, customer service or operating efficiency may represent a potential reputational risk.

For further details of our reputational risk management, see page 119 of the Annual Report and Accounts 2017.

Sustainability risk

Sustainability risk arises from the provision of financial services to companies or projects which indirectly result in unacceptable impacts on people or on the environment.

Sustainability risk is:

- measured by assessing the potential sustainability effect of a customer's activities and assigning a Sustainability Risk Rating to all high-risk transactions;
- monitored quarterly by the RMM and monthly by the Group's Sustainability Risk function; and
- managed using sustainability risk policies covering project finance lending and sector-based sustainability policies for sectors and themes with potentially large environmental or social impacts.

For further details on sustainability risk management, see page 120 of the Annual Report and Accounts 2017.

Business risk

The PRA specifies that banks, as part of their ICAAP, should review their exposure to business risk.

Business risk is the potential negative effect on profits and capital from the Group not meeting our strategic objectives, as a result of unforeseen changes in the business and regulatory environment, exposure to economic cycles and technological changes.

We manage and mitigate business risk through our risk appetite, business planning and stress testing processes, so that our business model and planned activities are monitored, resourced and capitalised consistent with the commercial, economic and risk environment in which the Group operates, and that any potential vulnerabilities of our business plans are identified at an early stage so that mitigating actions can be taken.

Dilution risk

Dilution risk is the risk that an amount receivable is reduced through cash or non-cash credit to the obligor, and arises mainly from factoring and invoice discounting transactions.

Where there is recourse to the seller, we treat these transactions as loans secured by the collateral of the debts purchased and do not report dilution risk for them. For our non-recourse portfolio, we do not report any dilution risk, as we obtain an indemnity from the seller that indemnifies us against this risk. Moreover, factoring transactions involve lending at a discount to the face-value of the receivables which provides protection against dilution risk.

Remuneration

The Group's remuneration policy, including the remuneration committee membership and activities, remuneration strategy, and tables showing remuneration details of HSBC's Identified Staff and Material Risk Takers, is set out in the Directors' Remuneration Report on page 141 of the Annual Report and Accounts 2017. An overview of our Group remuneration policy is available on our website (<http://www.hsbc.com/our-approach/remuneration>).

Appendix I

Additional tables

Table 49 sets out IRB exposures by obligor grade for central governments and central banks, institutions and corporates, all of which are assessed using our 23-grade CRR master scale. We benchmark the master scale against the ratings of external rating agencies. Each CRR band is associated with an external rating grade by reference to long-run default rates for that grade, represented by the average of issuer-weighted historical default rates.

The correspondence between the agency long-run default rates and the PD ranges of our master scale is obtained by matching a smoothed curve based on those default rates with our master scale reference PDs. This association between internal and external ratings is indicative and may vary over time. In these tables, the ratings of S&P are cited for illustration purposes, although we also benchmark against other agencies' ratings in an equivalent manner.

Table 49.a: Wholesale IRB exposure – by obligor grade – Central governments and central banks

| | CRRPD range | | Average net carrying values ¹ | Undrawn commitments | Mapped external rating |
|--------------------|-------------|------------------|--|---------------------|------------------------|
| | % | | \$bn | \$bn | |
| Default risk | 0.1 | 0.000 to 0.010 | 195.2 | 0.7 | AAA |
| Minimal | 1.1 | 0.011 to 0.028 | 70.6 | 0.8 | AA+ to AA |
| | 1.2 | 0.029 to 0.053 | 23.3 | 0.5 | AA- to A+ |
| Low | 2.1 | 0.054 to 0.095 | 9.3 | 0.1 | A |
| | 2.2 | 0.096 to 0.169 | 10.1 | — | A- |
| Satisfactory | 3.1 | 0.170 to 0.285 | 2.4 | — | BBB+ |
| | 3.2 | 0.286 to 0.483 | 2.3 | — | BBB |
| | 3.3 | 0.484 to 0.740 | 1.4 | — | BBB- |
| Fair | 4.1 | 0.741 to 1.022 | 1.0 | — | BB+ |
| | 4.2 | 1.023 to 1.407 | 1.0 | — | BB |
| | 4.3 | 1.408 to 1.927 | 1.5 | — | BB- |
| Moderate | 5.1 | 1.928 to 2.620 | 0.7 | — | BB- |
| | 5.2 | 2.621 to 3.579 | 1.8 | — | B+ |
| | 5.3 | 3.580 to 4.914 | 0.2 | 0.1 | B |
| Significant | 6.1 | 4.915 to 6.718 | 0.1 | 0.1 | B |
| | 6.2 | 6.719 to 8.860 | — | — | B- |
| High | 7.1 | 8.861 to 11.402 | — | — | CCC+ |
| | 7.2 | 11.403 to 15.000 | — | — | CCC+ |
| | 8.1 | 15.001 to 22.000 | — | — | CCC+ |
| Special Management | 8.2 | 22.001 to 50.000 | — | — | CCC+ |
| | 8.3 | 50.001 to 99.999 | — | — | CCC to C |
| Default | 9/10 | 100.000 | — | — | Default |
| At 31 Dec 2017 | | | 320.9 | 2.3 | |

For footnote, see page 71.

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Table 49.b: Wholesale IRB exposure – by obligor grade – Institutions

| | CRRPD range | | Average net carrying values ¹ | Undrawn commitments | Mapped external rating |
|--------------------|-------------|---------------------|--|---------------------|------------------------|
| | % | | \$bn | \$bn | |
| Default risk | 0.1 | 0.000 to 0.010 | 2.4 | — | AAA |
| Minimal | 1.1 | 0.011 to 0.028 | 20.7 | 1.6 | AA+ to AA |
| | 1.2 | 0.029 to 0.053 | 29.3 | 2.5 | AA- |
| Low | 2.1 | 0.054 to 0.095 | 17.2 | 2.6 | A+ to A |
| | 2.2 | 0.096 to 0.169 | 10.8 | 3.9 | A- |
| Satisfactory | 3.1 | 0.170 to 0.285 | 4.2 | 1.0 | BBB+ |
| | 3.2 | 0.286 to 0.483 | 3.5 | 0.5 | BBB |
| | 3.3 | 0.484 to 0.740 | 1.7 | 0.7 | BBB- |
| Fair | 4.1 | 0.741 to 1.022 | 1.3 | 0.4 | BB+ |
| | 4.2 | 1.023 to 1.407 | 0.5 | 0.2 | BB |
| | 4.3 | 1.408 to 1.927 | 0.2 | 0.1 | BB- |
| Moderate | 5.1 | 1.928 to 2.620 | 0.2 | — | BB- |
| | 5.2 | 2.621 to 3.579 | 0.1 | — | B+ |
| | 5.3 | 3.580 to 4.914 | — | — | B |
| Significant | 6.1 | 4.915 to 6.718 | — | — | B- |
| | 6.2 | 6.719 to 8.860 | — | — | B- |
| High | 7.1 | 8.861 to 11.402 | — | — | CCC+ |
| | 7.2 | 11.403 to 15.0000.1 | — | 0.1 | CCC+ |
| | 8.1 | 15.001 to 22.000— | — | — | CCC |
| Special Management | 8.2 | 22.001 to 50.0000.1 | — | — | CCC- to CC |
| | 8.3 | 50.001 to 99.999— | — | — | C |
| Default | 9/10 | 100.000 | — | — | Default |
| At 31 Dec 2017 | | | 92.3 | 13.6 | |

For footnote, see page 71.

Table 49.c: Wholesale IRB exposure – by obligor grade – Corporates²

| | CRRPD range | | Average net carrying values ¹ | Undrawn commitments | Mapped external rating |
|--------------|-------------|----------------|--|---------------------|------------------------|
| | % | | \$bn | \$bn | |
| Default risk | 0.1 | 0.000 to 0.010 | — | — | |
| Minimal | 1.1 | 0.011 to 0.028 | 27.7 | 10.4 | AAA to AA |
| | 1.2 | 0.029 to 0.053 | 61.3 | 39.3 | AA- |
| Low | 2.1 | 0.054 to 0.095 | 82.2 | 53.1 | A+ to A |
| | 2.2 | 0.096 to 0.169 | 101.5 | 65.6 | A- |
| Satisfactory | 3.1 | 0.170 to 0.285 | 112.8 | 70.9 | BBB+ |
| | 3.2 | 0.286 to 0.483 | 105.8 | 57.6 | BBB |
| | 3.3 | 0.484 to 0.740 | 91.1 | 46.5 | BBB- |
| Fair | 4.1 | 0.741 to 1.022 | 75.0 | 34.4 | BB+ |
| | 4.2 | 1.023 to 1.407 | 49.0 | 23.6 | BB |
| | 4.3 | 1.408 to 1.927 | 48.0 | 22.2 | BB- |
| Moderate | 5.1 | 1.928 to 2.620 | 71.5 | 28.9 | BB- |
| | 5.2 | 2.621 to 3.579 | 23.6 | 10.2 | B+ |
| | 5.3 | 3.580 to 4.914 | 19.0 | 8.8 | B |

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| | | | | | |
|--------------------|------|------------------|-------|-------|------------|
| Significant | 6.1 | 4.915 to 6.718 | 14.2 | 6.6 | B- |
| | 6.2 | 6.719 to 8.860 | 7.6 | 2.8 | B- |
| High | 7.1 | 8.861 to 11.402 | 3.2 | 1.0 | CCC+ |
| | 7.2 | 11.403 to 15.000 | 1.8 | 0.5 | CCC+ |
| | 8.1 | 15.001 to 22.000 | 3.4 | 1.8 | CCC |
| Special Management | 8.2 | 22.001 to 50.000 | 1.3 | 0.5 | CCC- to CC |
| | 8.3 | 50.001 to 99.999 | 0.3 | 0.1 | C |
| Default | 9/10 | 100.000 | 4.7 | 1.4 | Default |
| At 31 Dec 2017 | | | 905.0 | 486.2 | |

¹ Average net carrying value are calculated by aggregating the net carrying values of the last five quarters and dividing by five.

² Corporates excludes specialised lending exposures subject to supervisory slotting approach.

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PD, LGD, RWA and exposure by country

The following tables set out the exposure-weighted average PD, exposure-weighted average LGD, RWAs and exposure by the

location of the principal operations of the lending subsidiary or branch.

Table 50.a: PD, LGD, RWA and exposure by country – wholesale IRB advanced approach all asset classes¹²

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 2.15 | 36.0 | 91.8 | 181.0 |
| – France | 1.88 | 30.2 | 15.2 | 34.7 |
| – Germany | 0.16 | 41.6 | 0.3 | 1.5 |
| – Switzerland | 0.02 | 43.6 | 0.5 | 8.1 |
| Asia | | | | |
| – Hong Kong | 0.67 | 40.3 | 86.0 | 291.8 |
| – Australia | 0.67 | 43.6 | 9.1 | 24.9 |
| – India | 0.75 | 54.3 | 8.4 | 18.3 |
| – Indonesia | 4.40 | 58.5 | 5.5 | 6.4 |
| – Mainland China | 0.70 | 48.8 | 28.5 | 76.9 |
| – Malaysia | 1.00 | 47.4 | 6.9 | 15.6 |
| – Singapore | 0.49 | 42.0 | 10.2 | 40.5 |
| – Taiwan | 0.16 | 47.8 | 3.0 | 15.9 |
| Middle East and North Africa | | | | |
| – Egypt | 2.78 | 44.9 | 2.8 | 3.5 |
| – Turkey | 0.40 | 45.1 | 0.5 | 1.1 |
| – UAE | 0.09 | 38.7 | 1.5 | 9.1 |
| North America | | | | |
| – US | 1.27 | 34.5 | 44.7 | 130.1 |
| – Canada | 1.38 | 34.5 | 21.6 | 53.7 |
| Latin America | | | | |
| – Argentina | 1.66 | 45.1 | 1.5 | 1.5 |
| – Mexico | 0.19 | 44.5 | 4.3 | 9.0 |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 2.18 | 35.4 | 79.6 | 170.9 |
| – France | 2.98 | 30.5 | 12.6 | 28.7 |
| – Germany | 0.24 | 42.1 | 0.3 | 1.1 |
| – Switzerland | 0.02 | 43.7 | 0.7 | 13.0 |
| Asia | | | | |
| – Hong Kong | 0.73 | 41.1 | 80.6 | 285.8 |
| – Australia | 0.81 | 43.1 | 7.6 | 20.7 |
| – India | 1.15 | 55.0 | 8.4 | 17.8 |
| – Indonesia | 7.46 | 52.7 | 4.8 | 6.2 |
| – Mainland China | 0.87 | 48.1 | 25.2 | 67.4 |
| – Malaysia | 1.09 | 46.7 | 6.1 | 13.2 |
| – Singapore | 0.70 | 42.3 | 9.2 | 35.6 |

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| | | | | |
|------------------------------|------|------|------|-------|
| – Taiwan | 0.19 | 48.0 | 3.0 | 15.2 |
| Middle East and North Africa | | | | |
| – Egypt | 2.25 | 45.0 | 2.7 | 3.1 |
| – Turkey | 0.37 | 45.1 | 0.5 | 1.2 |
| – UAE | 0.14 | 36.6 | 1.8 | 11.2 |
| North America | | | | |
| – US | 1.51 | 35.7 | 50.8 | 144.1 |
| – Canada | 1.89 | 33.7 | 20.9 | 50.6 |
| Latin America | | | | |
| – Argentina | 2.25 | 45.3 | 1.6 | 1.5 |
| – Mexico | 0.90 | 44.5 | 2.6 | 7.0 |

¹ Excludes specialised lending exposures subject to supervisory slotting approach.

² Amounts shown by geographical region and country in this table are based on the location of principal operation of the lending subsidiary.

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Table 50.b: PD, LGD, RWA and exposure by country – wholesale IRB advanced approach central governments and central banks

| | Exposure- weighted average PD | Exposure- weighted average LGD | RWAs | Exposure value |
|------------------------------|-------------------------------------|--------------------------------------|------|-------------------|
| At 31 Dec 2017 | % | % | \$bn | \$bn |
| Europe | | | | |
| – UK | 0.03 | 44.1 | 2.0 | 18.0 |
| – France | 0.02 | 45.0 | 0.2 | 1.7 |
| – Germany | 0.04 | 45.0 | 0.1 | 0.5 |
| – Switzerland | 0.01 | 45.0 | 0.3 | 6.8 |
| Asia | | | | |
| – Hong Kong | 0.01 | 44.5 | 4.6 | 89.8 |
| – Australia | 0.01 | 45.0 | 0.4 | 6.6 |
| – India | 0.07 | 45.0 | 1.4 | 6.8 |
| – Indonesia | 0.20 | 45.0 | 0.6 | 1.9 |
| – Mainland China | 0.02 | 45.0 | 2.1 | 29.0 |
| – Malaysia | 0.04 | 45.0 | 0.7 | 4.9 |
| – Singapore | 0.01 | 45.0 | 0.7 | 15.8 |
| – Taiwan | 0.02 | 45.0 | 0.6 | 10.1 |
| Middle East and North Africa | | | | |
| – Egypt | 2.25 | 45.0 | 2.3 | 2.2 |
| – Turkey | 0.42 | 45.0 | 0.5 | 0.9 |
| – UAE | 0.04 | 44.6 | 0.7 | 6.0 |
| North America | | | | |
| – US | 0.01 | 33.4 | 3.2 | 42.8 |
| – Canada | 0.02 | 33.2 | 1.8 | 15.9 |
| Latin America | | | | |
| – Argentina | 1.65 | 45.0 | 1.4 | 1.4 |
| – Mexico | 0.16 | 45.0 | 3.8 | 8.1 |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 0.04 | 44.6 | 2.5 | 20.1 |
| – France | 0.06 | 45.0 | 0.2 | 1.8 |
| – Germany | 0.05 | 45.0 | 0.1 | 0.5 |
| – Switzerland | 0.01 | 45.0 | 0.5 | 11.7 |
| Asia | | | | |
| – Hong Kong | 0.01 | 44.5 | 5.5 | 111.9 |
| – Australia | 0.01 | 45.0 | 0.3 | 5.9 |
| – India | 0.07 | 45.0 | 1.4 | 6.1 |
| – Indonesia | 0.17 | 45.0 | 0.5 | 1.8 |
| – Mainland China | 0.02 | 45.0 | 1.9 | 26.1 |
| – Malaysia | 0.04 | 45.0 | 0.7 | 5.2 |
| – Singapore | 0.01 | 45.0 | 0.7 | 14.3 |
| – Taiwan | 0.02 | 45.0 | 0.5 | 8.9 |
| Middle East and North Africa | | | | |
| – Egypt | 2.95 | 45.0 | 2.4 | 2.2 |

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| | | | | |
|---------------|------|------|-----|------|
| – Turkey | 0.44 | 45.0 | 0.4 | 0.8 |
| – UAE | 0.14 | 44.6 | 0.8 | 6.0 |
| North America | | | | |
| – US | 0.01 | 37.6 | 3.9 | 53.6 |
| – Canada | 0.02 | 31.4 | 2.1 | 16.6 |
| Latin America | | | | |
| – Argentina | 2.23 | 45.0 | 1.5 | 1.5 |
| – Mexico | 0.08 | 45.0 | 2.2 | 6.2 |

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Table 50.c: PD, LGD, RWA and exposure by country – wholesale IRB advanced approach institutions

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 0.21 | 37.4 | 3.5 | 12.1 |
| – France | 0.17 | 38.9 | 0.5 | 1.7 |
| – Germany | 0.13 | 39.4 | 0.2 | 0.9 |
| – Switzerland | 0.06 | 35.1 | 0.2 | 1.2 |
| Asia | | | | |
| – Hong Kong | 0.06 | 42.1 | 5.4 | 36.1 |
| – Australia | 0.07 | 41.8 | 0.5 | 2.6 |
| – India | 0.17 | 45.0 | 0.3 | 1.1 |
| – Indonesia | 0.43 | 49.7 | — | 0.1 |
| – Mainland China | 0.14 | 46.4 | 2.0 | 8.0 |
| – Malaysia | 0.18 | 47.5 | 0.5 | 1.8 |
| – Singapore | 0.12 | 42.0 | 0.6 | 3.6 |
| – Taiwan | 0.06 | 45.0 | — | 0.2 |
| Middle East and North Africa | | | | |
| – Egypt | 0.08 | 45.0 | 0.2 | 0.9 |
| – Turkey | 0.11 | 45.2 | — | 0.2 |
| – UAE | 0.18 | 45.3 | 0.3 | 0.8 |
| North America | | | | |
| – US | 0.11 | 44.6 | 1.4 | 6.9 |
| – Canada | 0.04 | 22.8 | 0.3 | 3.5 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | 0.45 | 45.0 | 0.3 | 0.6 |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 0.24 | 31.6 | 2.2 | 10.4 |
| – France | 0.17 | 41.3 | 0.6 | 1.6 |
| – Germany | 0.16 | 39.0 | 0.1 | 0.5 |
| – Switzerland | 0.04 | 32.1 | 0.2 | 1.3 |
| Asia | | | | |
| – Hong Kong | 0.06 | 42.2 | 4.9 | 30.9 |
| – Australia | 0.05 | 41.0 | 0.5 | 2.8 |
| – India | 0.26 | 45.0 | 0.3 | 0.8 |
| – Indonesia | — | — | — | — |
| – Mainland China | 0.12 | 45.2 | 1.8 | 8.1 |
| – Malaysia | 0.38 | 48.5 | 0.4 | 0.9 |
| – Singapore | 0.08 | 43.9 | 0.7 | 4.9 |
| – Taiwan | 0.10 | 45.0 | 0.1 | 0.3 |
| Middle East and North Africa | | | | |
| – Egypt | 0.08 | 45.0 | 0.1 | 0.3 |
| – Turkey | 0.07 | 45.0 | — | 0.3 |
| – UAE | 0.08 | 45.4 | 0.2 | 0.9 |

| | | | | |
|---------------|------|------|-----|-----|
| North America | | | | |
| – US | 0.31 | 42.4 | 1.0 | 2.5 |
| – Canada | 0.04 | 21.6 | 0.3 | 2.6 |
| Latin America | | | | |
| – Argentina | 0.06 | 45.0 | — | — |
| – Mexico | 0.50 | 45.0 | 0.3 | 0.4 |

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Table 50.d: PD, LGD, RWA and exposure by country – wholesale IRB advanced approach corporates¹

| | Exposure- weighted average PD | Exposure- weighted average LGD | RWAs | Exposure value ¹ |
|------------------------------|-------------------------------------|--------------------------------------|------|--------------------------------|
| At 31 Dec 2017 | % | % | \$bn | \$bn |
| Europe | | | | |
| – UK | 2.56 | 34.9 | 86.3 | 150.9 |
| – France | 2.07 | 28.9 | 14.5 | 31.3 |
| – Germany | 1.82 | 45.0 | — | 0.1 |
| – Switzerland | 0.04 | 45.0 | — | 0.1 |
| Asia | | | | |
| – Hong Kong | 1.15 | 37.6 | 76.0 | 165.9 |
| – Australia | 1.06 | 43.3 | 8.2 | 15.7 |
| – India | 1.25 | 61.4 | 6.7 | 10.4 |
| – Indonesia | 6.33 | 64.6 | 4.9 | 4.4 |
| – Mainland China | 1.30 | 52.0 | 24.4 | 39.9 |
| – Malaysia | 1.69 | 48.7 | 5.7 | 8.9 |
| – Singapore | 0.92 | 39.7 | 8.9 | 21.1 |
| – Taiwan | 0.42 | 53.0 | 2.4 | 5.6 |
| Middle East and North Africa | | | | |
| – Egypt | 11.63 | 44.5 | 0.3 | 0.4 |
| – Turkey | 0.00 | 0.0 | — | — |
| – UAE | 0.21 | 20.9 | 0.5 | 2.3 |
| North America | | | | |
| – US | 2.04 | 34.1 | 40.1 | 80.4 |
| – Canada | 2.15 | 36.3 | 19.5 | 34.3 |
| Latin America | | | | |
| – Argentina | 1.95 | 46.7 | 0.1 | 0.1 |
| – Mexico | 0.65 | 29.2 | 0.2 | 0.3 |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 2.63 | 34.3 | 74.9 | 140.4 |
| – France | 3.36 | 28.8 | 11.8 | 25.3 |
| – Germany | 2.71 | 45.4 | 0.1 | 0.1 |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 1.43 | 38.1 | 70.2 | 143.0 |
| – Australia | 1.38 | 42.7 | 6.8 | 12.0 |
| – India | 1.82 | 61.3 | 6.7 | 10.9 |
| – Indonesia | 10.48 | 55.8 | 4.3 | 4.4 |
| – Mainland China | 1.71 | 51.3 | 21.5 | 33.2 |
| – Malaysia | 1.94 | 47.7 | 5.0 | 7.1 |
| – Singapore | 1.49 | 39.5 | 7.8 | 16.4 |
| – Taiwan | 0.45 | 52.7 | 2.4 | 6.0 |
| Middle East and North Africa | | | | |
| – Egypt | 0.64 | 44.9 | 0.2 | 0.6 |

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| | | | | |
|---------------|-------|------|------|------|
| – Turkey | 0.77 | 46.2 | 0.1 | 0.1 |
| – UAE | 0.16 | 23.9 | 0.8 | 4.3 |
| North America | | | | |
| – US | 2.45 | 34.4 | 45.9 | 88.0 |
| – Canada | 3.02 | 35.9 | 18.5 | 31.4 |
| Latin America | | | | |
| – Argentina | 3.10 | 59.2 | 0.1 | — |
| – Mexico | 15.62 | 34.7 | 0.1 | 0.4 |

1 Excludes specialised lending exposures subject to supervisory slotting approach.

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Table 50.e: PD, LGD, RWA and exposure by country – wholesale IRB foundation approach all asset classes

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 2.90 | 40.8 | 5.8 | 9.8 |
| – France | 3.22 | 45.0 | 0.4 | 0.4 |
| – Germany | 1.37 | 44.9 | 11.1 | 18.4 |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | 4.50 | 44.8 | 7.9 | 12.3 |
| North America | | | | |
| – US | — | — | — | — |
| – Canada | — | — | — | — |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 1.94 | 41.3 | 4.4 | 8.2 |
| – France | 4.30 | 45.0 | 0.2 | 0.3 |
| – Germany | 0.90 | 44.8 | 10.1 | 15.6 |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | 3.72 | 44.2 | 7.8 | 12.8 |

| | | | | |
|---------------|---|---|---|---|
| North America | | | | |
| – US | — | — | — | — |
| – Canada | — | — | — | — |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |

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Table 50.f: PD, LGD, RWA and exposure by country – wholesale IRB foundation approach central governments and central banks

| | Exposure- weighted average PD | Exposure- weighted average LGD | RWAs | Exposure value |
|------------------------------|-------------------------------------|--------------------------------------|------|-------------------|
| At 31 Dec 2017 | % | % | \$bn | \$bn |
| Europe | | | | |
| – UK | — | — | — | — |
| – France | — | — | — | — |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | 0.05 | 45.0 | — | 0.1 |
| North America | | | | |
| – US | — | — | — | — |
| – Canada | — | — | — | — |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | — | — | — | — |
| – France | — | — | — | — |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |

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| | | | | |
|---------------|------|------|---|-----|
| - Turkey | — | — | — | — |
| - UAE | 0.04 | 45.0 | — | 0.1 |
| North America | | | | |
| - US | — | — | — | — |
| - Canada | — | — | — | — |
| Latin America | | | | |
| - Argentina | — | — | — | — |
| - Mexico | — | — | — | — |

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Table 50.g: PD, LGD, RWA and exposure by country – wholesale IRB foundation approach institutions

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | — | — | — | — |
| – France | — | — | — | — |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | 0.11 | 45.0 | 0.1 | 0.2 |
| North America | | | | |
| – US | — | — | — | — |
| – Canada | — | — | — | — |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | — | — | — | — |
| – France | — | — | — | — |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | 0.28 | 45.0 | 0.1 | 0.2 |

| | | | | |
|---------------|---|---|---|---|
| North America | | | | |
| – US | — | — | — | — |
| – Canada | — | — | — | — |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |

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Table 50.h: PD, LGD, RWA and exposure by country – wholesale IRB foundation approach corporates

| | Exposure- weighted average PD | Exposure- weighted average LGD | RWAs | Exposure value |
|------------------------------|-------------------------------------|--------------------------------------|------|-------------------|
| At 31 Dec 2017 | % | % | \$bn | \$bn |
| Europe | | | | |
| – UK | 2.90 | 40.8 | 5.8 | 9.8 |
| – France | 3.22 | 45.0 | 0.4 | 0.4 |
| – Germany | 1.37 | 44.9 | 11.1 | 18.4 |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | 4.60 | 44.8 | 7.8 | 12.0 |
| North America | | | | |
| – US | — | — | — | — |
| – Canada | — | — | — | — |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 1.94 | 41.3 | 4.4 | 8.2 |
| – France | 4.30 | 45.0 | 0.2 | 0.3 |
| – Germany | 0.91 | 44.8 | 10.1 | 15.6 |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | — | — | — | — |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |

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| | | | | |
|---------------|------|------|-----|------|
| - Turkey | — | — | — | — |
| - UAE | 3.81 | 44.2 | 7.7 | 12.5 |
| North America | | | | |
| - US | — | — | — | — |
| - Canada | — | — | — | — |
| Latin America | | | | |
| - Argentina | — | — | — | — |
| - Mexico | — | — | — | — |

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Table 50.i: PD, LGD, RWA and exposure by country – retail IRB approach all asset classes

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 1.48 | 30.9 | 23.8 | 180.7 |
| – France | 4.35 | 14.0 | 3.5 | 26.3 |
| – Germany | — | — | — | — |
| – Switzerland | 0.74 | 2.0 | 0.1 | 6.7 |
| Asia | | | | |
| – Hong Kong | 0.79 | 38.5 | 22.7 | 111.8 |
| – Australia | 0.91 | 10.4 | 0.9 | 14.1 |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | 4.56 | 11.8 | 1.3 | 5.0 |
| – Singapore | 0.91 | 21.8 | 1.1 | 6.3 |
| – Taiwan | 1.33 | 11.7 | 0.7 | 4.9 |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | 5.33 | 63.3 | 9.1 | 21.9 |
| – Canada | 0.80 | 19.4 | 2.4 | 22.0 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 1.58 | 30.5 | 18.6 | 155.8 |
| – France | 5.06 | 14.6 | 2.8 | 22.7 |
| – Germany | — | — | — | — |
| – Switzerland | 0.73 | 2.2 | 0.2 | 8.1 |
| Asia | | | | |
| – Hong Kong | 0.87 | 39.2 | 20.2 | 102.3 |
| – Australia | 0.90 | 10.6 | 0.7 | 11.6 |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | 4.05 | 12.1 | 1.0 | 4.5 |
| – Singapore | 0.75 | 22.3 | 1.1 | 6.7 |
| – Taiwan | 1.20 | 11.5 | 0.5 | 4.1 |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |

| | | | | |
|---------------|------|------|------|------|
| North America | | | | |
| – US | 9.67 | 67.3 | 18.5 | 29.8 |
| – Canada | 0.96 | 19.2 | 2.4 | 18.7 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |

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Pillar 3 Disclosures at 31 December 2017

Table 50.j: PD, LGD, RWA and exposure by country – retail IRB approach
 – retail secured by mortgages on immovable property
 non-SME

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 1.20 | 13.2 | 6.5 | 134.4 |
| – France | 6.27 | 14.0 | 0.7 | 3.7 |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 0.65 | 10.0 | 12.7 | 69.2 |
| – Australia | 0.91 | 10.4 | 0.9 | 14.1 |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | 4.56 | 11.8 | 1.3 | 5.0 |
| – Singapore | 0.91 | 21.8 | 1.1 | 6.3 |
| – Taiwan | 1.33 | 11.7 | 0.7 | 4.9 |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | 6.16 | 54.7 | 7.5 | 17.1 |
| – Canada | 0.69 | 17.6 | 1.9 | 20.1 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 1.33 | 12.2 | 5.4 | 114.9 |
| – France | 6.82 | 14.0 | 0.6 | 3.5 |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 0.69 | 10.0 | 10.7 | 62.5 |
| – Australia | 0.90 | 10.6 | 0.7 | 11.6 |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | 4.05 | 12.1 | 1.0 | 4.5 |
| – Singapore | 0.75 | 22.3 | 1.1 | 6.7 |
| – Taiwan | 1.20 | 11.5 | 0.5 | 4.1 |

| | | | | |
|------------------------------|-------|------|------|------|
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | 11.01 | 59.5 | 14.6 | 23.3 |
| – Canada | 0.85 | 17.2 | 1.9 | 16.7 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |

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Table 50.k: PD, LGD, RWA and exposure by country – retail IRB approach retail secured by mortgages on immovable property SME

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | — | — | — | — |
| – France | 7.71 | 25.8 | 0.4 | 0.6 |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 0.77 | 11.4 | — | 0.6 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | — | — | — | — |
| – Canada | 2.10 | 28.5 | 0.1 | 0.3 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | — | — | — | — |
| – France | 7.70 | 25.8 | 0.2 | 0.6 |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 0.89 | 11.7 | — | 0.6 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |

| | | | | |
|---------------|------|------|-----|-----|
| North America | | | | |
| – US | — | — | — | — |
| – Canada | 2.10 | 29.6 | 0.1 | 0.3 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |

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Pillar 3 Disclosures at 31 December 2017

Table 50.1: PD, LGD, RWA and exposure by country – retail IRB approach retail QRRE

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 1.26 | 85.8 | 6.8 | 31.4 |
| – France | — | — | — | — |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 1.01 | 100.2 | 8.1 | 34.0 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | 1.39 | 93.6 | 0.9 | 3.5 |
| – Canada | 2.51 | 64.4 | 0.1 | 0.3 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 1.14 | 85.5 | 5.4 | 28.0 |
| – France | — | — | — | — |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 1.10 | 100.0 | 8.1 | 32.2 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |

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| | | | | |
|---------------|------|------|-----|-----|
| - Turkey | — | — | — | — |
| - UAE | — | — | — | — |
| North America | | | | |
| - US | 1.49 | 93.6 | 1.0 | 3.4 |
| - Canada | 2.72 | 60.7 | 0.1 | 0.3 |
| Latin America | | | | |
| - Argentina | — | — | — | — |
| - Mexico | — | — | — | — |

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Table 50.m: PD, LGD, RWA and exposure by country – retail IRB approach other SME

| | Exposure- weighted average PD % | Exposure- weighted average LGD % | RWAs \$bn | Exposure value \$bn |
|------------------------------|--|---|--------------|---------------------------|
| At 31 Dec 2017 | | | | |
| Europe | | | | |
| – UK | 6.82 | 67.7 | 5.0 | 6.8 |
| – France | 19.77 | 30.4 | 0.8 | 2.3 |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 0.17 | 15.9 | — | 0.1 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | — | — | — | — |
| – Canada | 5.44 | 45.5 | 0.1 | 0.2 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 7.71 | 66.6 | 3.8 | 6.1 |
| – France | 20.34 | 30.6 | 0.7 | 2.3 |
| – Germany | — | — | — | — |
| – Switzerland | — | — | — | — |
| Asia | | | | |
| – Hong Kong | 0.10 | 11.3 | — | 0.1 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |

| | | | | |
|---------------|------|------|-----|-----|
| North America | | | | |
| – US | — | — | — | — |
| – Canada | 4.33 | 48.4 | 0.1 | 0.2 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |

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Pillar 3 Disclosures at 31 December 2017

Table 50.n: PD, LGD, RWA and exposure by country – retail IRB approach other non-SME

| | Exposure- weighted average PD | Exposure- weighted average LGD | RWAs | Exposure value |
|------------------------------|-------------------------------------|--------------------------------------|------|-------------------|
| At 31 Dec 2017 | % | % | \$bn | \$bn |
| Europe | | | | |
| – UK | 2.44 | 80.6 | 5.5 | 8.1 |
| – France | 2.09 | 11.8 | 1.6 | 19.7 |
| – Germany | — | — | — | — |
| – Jersey | — | — | — | — |
| – Switzerland | 0.74 | 2.0 | 0.1 | 6.7 |
| Asia | | | | |
| – Hong Kong | 1.15 | 24.2 | 1.9 | 7.9 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |
| Middle East and North Africa | | | | |
| – Egypt | — | — | — | — |
| – Turkey | — | — | — | — |
| – UAE | — | — | — | — |
| North America | | | | |
| – US | 4.88 | 96.6 | 0.7 | 1.3 |
| – Canada | 1.06 | 30.8 | 0.2 | 1.1 |
| Latin America | | | | |
| – Argentina | — | — | — | — |
| – Mexico | — | — | — | — |
| At 31 Dec 2016 | | | | |
| Europe | | | | |
| – UK | 2.05 | 81.8 | 4.0 | 6.8 |
| – France | 2.46 | 12.1 | 1.3 | 16.3 |
| – Germany | — | — | — | — |
| – Jersey | 0.52 | 2.6 | — | 1.1 |
| – Switzerland | 0.73 | 2.2 | 0.2 | 8.1 |
| Asia | | | | |
| – Hong Kong | 1.37 | 21.2 | 1.4 | 6.9 |
| – Australia | — | — | — | — |
| – India | — | — | — | — |
| – Indonesia | — | — | — | — |
| – Mainland China | — | — | — | — |
| – Malaysia | — | — | — | — |
| – Singapore | — | — | — | — |
| – Taiwan | — | — | — | — |

| | | | | |
|------------------------------|------|------|-----|-----|
| Middle East and North Africa | | | | |
| - Egypt | — | — | — | — |
| - Turkey | — | — | — | — |
| - UAE | — | — | — | — |
| North America | | | | |
| - US | 8.66 | 96.5 | 2.9 | 3.1 |
| - Canada | 1.03 | 28.3 | 0.2 | 1.2 |
| Latin America | | | | |
| - Argentina | — | — | — | — |
| - Mexico | — | — | — | — |

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Table 51: Retail IRB exposure – by internal PD band

| | PD range % | Average net carrying values ¹ \$bn | Undrawn commitments \$bn |
|--|-------------------|--|-----------------------------|
| At 31 Dec 2017 | | | |
| Secured by mortgages on immovable property | | | |
| SME | | 1.5 | — |
| Band 1 | 0.000 to 0.483 | 0.6 | — |
| Band 2 | 0.484 to 1.022 | 0.2 | — |
| Band 3 | 1.023 to 4.914 | 0.4 | — |
| Band 4 | 4.915 to 8.860 | 0.2 | — |
| Band 5 | 8.861 to 15.000 | 0.1 | — |
| Band 6 | 15.001 to 50.000 | — | — |
| Band 7 | 50.001 to 100.000 | — | — |
| Secured by mortgages on immovable property | | | |
| Non-SME | | 260.5 | 18.6 |
| Band 1 | 0.000 to 0.483 | 213.0 | 16.9 |
| Band 2 | 0.484 to 1.022 | 21.2 | 0.9 |
| Band 3 | 1.023 to 4.914 | 18.2 | 0.7 |
| Band 4 | 4.915 to 8.860 | 3.0 | — |
| Band 5 | 8.861 to 15.000 | 0.5 | — |
| Band 6 | 15.001 to 50.000 | 1.5 | 0.1 |
| Band 7 | 50.001 to 100.000 | 3.1 | — |
| Qualifying revolving retail exposures | | | |
| | | 120.2 | 104.7 |
| Band 1 | 0.000 to 0.483 | 96.2 | 91.2 |
| Band 2 | 0.484 to 1.022 | 10.3 | 7.1 |
| Band 3 | 1.023 to 4.914 | 11.1 | 5.6 |
| Band 4 | 4.915 to 8.860 | 1.4 | 0.5 |
| Band 5 | 8.861 to 15.000 | 0.4 | 0.1 |
| Band 6 | 15.001 to 50.000 | 0.5 | 0.1 |
| Band 7 | 50.001 to 100.000 | 0.3 | 0.1 |
| Other SME | | | |
| | | 10.2 | 4.2 |
| Band 1 | 0.000 to 0.483 | 1.3 | 0.8 |
| Band 2 | 0.484 to 1.022 | 1.8 | 0.9 |
| Band 3 | 1.023 to 4.914 | 4.9 | 1.9 |
| Band 4 | 4.915 to 8.860 | 1.1 | 0.3 |
| Band 5 | 8.861 to 15.000 | 0.5 | 0.1 |
| Band 6 | 15.001 to 50.000 | 0.2 | 0.1 |
| Band 7 | 50.001 to 100.000 | 0.4 | 0.1 |
| Other non-SME | | | |
| | | 53.1 | 16.0 |
| Band 1 | 0.000 to 0.483 | 33.5 | 12.8 |
| Band 2 | 0.484 to 1.022 | 8.2 | 1.6 |
| Band 3 | 1.023 to 4.914 | 9.6 | 1.4 |
| Band 4 | 4.915 to 8.860 | 0.9 | 0.1 |
| Band 5 | 8.861 to 15.000 | 0.3 | — |
| Band 6 | 15.001 to 50.000 | 0.2 | — |
| Band 7 | 50.001 to 100.000 | 0.4 | 0.1 |
| Total retail | | | |
| | | 445.5 | 143.5 |
| Band 1 | 0.000 to 0.483 | 344.6 | 121.7 |
| Band 2 | 0.484 to 1.022 | 41.7 | 10.5 |
| Band 3 | 1.023 to 4.914 | 44.2 | 9.6 |

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| | | | |
|--------|-------------------|-----|-----|
| Band 4 | 4.915 to 8.860 | 6.6 | 0.9 |
| Band 5 | 8.861 to 15.000 | 1.8 | 0.2 |
| Band 6 | 15.001 to 50.000 | 2.4 | 0.3 |
| Band 7 | 50.001 to 100.000 | 4.2 | 0.3 |

¹ Average net carrying values are calculated by aggregating the net carrying values of the last five quarters and dividing by five.

Pillar 3 Disclosures at 31 December 2017

Table 52: IRB expected loss and CRAs – by exposure class

| | Expected loss \$bn | CRA | |
|--|-----------------------|------------------|-----------------------------|
| | | Balances \$bn | Charge for the year \$bn |
| 1 Total IRB approach | | | |
| 2 Central governments and central banks | 0.1 | — | — |
| 3 Institutions | — | — | — |
| 4 Corporates | 5.3 | 4.2 | 0.7 |
| 5 Retail | 2.5 | 1.0 | 0.3 |
| – Secured by mortgages on immovable property SME | — | — | — |
| – Secured by mortgages on immovable property non-SME | 0.8 | 0.3 | — |
| – Qualifying revolving retail | 0.8 | 0.2 | 0.2 |
| – Other SME | 0.5 | 0.3 | — |
| – Other non-SME | 0.4 | 0.2 | 0.1 |
| 6 Total at 31 Dec 2017 | 7.9 | 5.2 | 1.0 |
| 1 Total IRB approach | | | |
| 2 Central governments and central banks | 0.1 | — | — |
| 3 Institutions | — | — | — |
| 4 Corporates | 5.7 | 4.3 | 1.1 |
| 5 Retail | 3.6 | 1.2 | 0.5 |
| – Secured by mortgages on immovable property SME | — | — | — |
| – Secured by mortgages on immovable property non-SME | 1.9 | 0.4 | 0.1 |
| – Qualifying revolving retail | 0.6 | 0.2 | 0.2 |
| – Other SME | 0.6 | 0.3 | — |
| – Other non-SME | 0.5 | 0.3 | 0.2 |
| 6 Total at 31 Dec 2016 | 9.4 | 5.5 | 1.6 |
| 1 Total IRB approach | | | |
| 2 Central governments and central banks | 0.2 | — | — |
| 3 Institutions | 0.1 | — | — |
| 4 Corporates | 5.5 | 4.5 | 1.0 |
| 5 Retail | 5.5 | 2.1 | 0.4 |
| – Secured by mortgages on immovable property SME | — | — | — |
| – Secured by mortgages on immovable property non-SME | 3.5 | 1.2 | — |
| – Qualifying revolving retail | 0.7 | 0.2 | 0.2 |
| – Other SME | 0.7 | 0.3 | — |
| – Other non-SME | 0.6 | 0.4 | 0.2 |
| 6 Total at 31 Dec 2015 | 11.3 | 6.6 | 1.4 |
| 1 Total IRB approach | | | |
| 2 Central governments and central banks | 0.3 | — | — |
| 3 Institutions | 0.3 | — | — |
| 4 Corporates | 5.2 | 4.2 | 1.1 |
| 5 Retail | 7.2 | 3.1 | 0.2 |
| – Secured by mortgages on immovable property SME | — | — | — |
| – Secured by mortgages on immovable property non-SME | 5.1 | 1.9 | (0.1) |
| – Qualifying revolving retail | 0.7 | 0.3 | 0.1 |

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| | | | |
|-----------------------|------|-----|-----|
| – Other SME | 0.7 | 0.4 | — |
| – Other non-SME | 0.7 | 0.5 | 0.2 |
| 6Total at 31 Dec 2014 | 13.0 | 7.3 | 1.3 |

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Table 53: Credit risk exposure – by geographical region

| | Exposure value | | | | | |
|--|----------------|-------|------|---------------|---------------|---------|
| | Europe | Asia | MENA | North America | Latin America | Total |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB advanced approach | 463.8 | 692.7 | 20.6 | 240.8 | 11.6 | 1,429.5 |
| – central governments and central banks | 29.9 | 190.8 | 14.5 | 61.5 | 10.5 | 307.2 |
| – institutions | 16.7 | 55.6 | 2.3 | 11.8 | 0.6 | 87.0 |
| – corporates | 202.5 | 303.0 | 3.8 | 123.6 | 0.5 | 633.4 |
| – total retail | 214.7 | 143.3 | — | 43.9 | — | 401.9 |
| – of which: | — | — | — | — | — | — |
| secured by mortgages on immovable property SME | 0.7 | 0.5 | — | 0.3 | — | 1.5 |
| secured by mortgages on immovable property non-SME | 138.1 | 100.8 | — | 37.2 | — | 276.1 |
| qualifying revolving retail | 31.4 | 34.0 | — | 3.8 | — | 69.2 |
| other SME | 9.1 | 0.1 | — | 0.2 | — | 9.4 |
| other non-SME | 35.4 | 7.9 | — | 2.4 | — | 45.7 |
| IRB securitisation positions | 25.9 | 2.8 | — | 4.0 | — | 32.7 |
| IRB non-credit obligation assets | 8.3 | 43.2 | 0.8 | 2.1 | 1.7 | 56.1 |
| IRB foundation approach | 30.7 | — | 15.4 | — | — | 46.1 |
| – central governments and central banks | — | — | 0.1 | — | — | 0.1 |
| – institutions | — | — | 0.2 | — | — | 0.2 |
| – corporates | 30.7 | — | 15.1 | — | — | 45.8 |
| Standardised approach | 220.8 | 86.3 | 39.7 | 15.3 | 22.0 | 384.1 |
| – central governments and central banks | 178.3 | 19.2 | 2.1 | 3.6 | 1.0 | 204.2 |
| – institutions | 0.5 | 0.1 | 1.8 | — | 0.1 | 2.5 |
| – corporates | 21.3 | 21.4 | 22.1 | 6.5 | 12.3 | 83.6 |
| – retail | 1.5 | 8.6 | 5.7 | 1.7 | 4.7 | 22.2 |
| – secured by mortgages on immovable property | 6.1 | 15.8 | 3.1 | 1.0 | 2.1 | 28.1 |
| – exposures in default | 1.0 | 0.5 | 1.0 | 0.3 | 0.3 | 3.1 |
| – regional governments or local authorities | — | — | 2.9 | — | 0.6 | 3.5 |
| – public sector entities | 0.1 | — | — | — | — | 0.1 |
| – equity | 1.2 | 13.3 | 0.2 | 1.0 | 0.3 | 16.0 |
| – items associated with particularly high risk | 3.3 | — | 0.1 | 0.3 | 0.1 | 3.8 |
| – securitisation positions | 0.3 | 1.4 | — | — | 0.3 | 2.0 |
| – claims in the form of CIU | 0.5 | — | — | — | — | 0.5 |
| – international organisations | 2.2 | — | — | — | — | 2.2 |
| – multilateral development banks | — | — | 0.3 | — | — | 0.3 |
| – other items | 4.5 | 6.0 | 0.4 | 0.9 | 0.2 | 12.0 |
| Total at 31 Dec 2017 | 749.5 | 825.0 | 76.5 | 262.2 | 35.3 | 1,948.5 |

Pillar 3 Disclosures at 31 December 2017

Table 53: Credit risk exposure – by geographical region (continued)

| | Exposure value | | | | | |
|--|----------------|-------|------|---------------|---------------|---------|
| | Europe | Asia | MENA | North America | Latin America | Total |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB advanced approach | 422.3 | 652.8 | 22.2 | 257.5 | 10.2 | 1,365.0 |
| – central governments and central banks | 37.2 | 205.4 | 14.0 | 73.6 | 9.2 | 339.4 |
| – institutions | 14.2 | 52.5 | 1.8 | 6.8 | 0.4 | 75.7 |
| – corporates | 183.0 | 264.5 | 6.4 | 128.6 | 0.6 | 583.1 |
| – total retail | 187.9 | 130.4 | — | 48.5 | — | 366.8 |
| – of which: | | | | | | |
| secured by mortgages on immovable property SME | 0.6 | 0.6 | — | 0.3 | — | 1.5 |
| secured by mortgages on immovable property non-SME | 118.5 | 90.6 | — | 39.9 | — | 249.0 |
| qualifying revolving retail | 28.0 | 32.2 | — | 3.8 | — | 64.0 |
| other SME | 8.4 | 0.1 | — | 0.2 | — | 8.7 |
| other non-SME | 32.4 | 6.9 | — | 4.3 | — | 43.6 |
| IRB securitisation positions | 29.0 | 0.8 | — | 4.0 | — | 33.8 |
| IRB non-credit obligation assets | 7.8 | 40.2 | 0.7 | 1.6 | 1.6 | 51.9 |
| IRB foundation approach | 26.1 | — | 16.7 | — | — | 42.8 |
| – central governments and central banks | — | — | 0.1 | — | — | 0.1 |
| – institutions | — | — | 0.3 | — | — | 0.3 |
| – corporates | 26.1 | — | 16.3 | — | — | 42.4 |
| Standardised approach | 172.2 | 85.8 | 41.3 | 15.6 | 19.2 | 334.1 |
| – central governments and central banks | 131.7 | 27.5 | 3.0 | 4.3 | 0.8 | 167.3 |
| – institutions | 0.3 | 0.2 | 1.4 | 0.2 | — | 2.1 |
| – corporates | 21.9 | 18.2 | 22.2 | 5.5 | 10.6 | 78.4 |
| – retail | 1.9 | 7.9 | 6.5 | 1.4 | 4.3 | 22.0 |
| – secured by mortgages on immovable property | 5.2 | 14.0 | 3.6 | 1.1 | 1.8 | 25.7 |
| – exposures in default | 1.0 | 0.4 | 1.2 | 0.3 | 0.4 | 3.3 |
| – regional governments or local authorities | — | — | 2.4 | — | 0.5 | 2.9 |
| – public sector entities | — | — | — | — | — | — |
| – equity | 1.4 | 12.1 | 0.2 | 1.1 | 0.4 | 15.2 |
| – items associated with particularly high risk | 2.8 | — | 0.1 | 0.4 | 0.1 | 3.4 |
| – securitisation positions | — | 0.8 | — | — | 0.1 | 0.9 |
| – claims in the form of CIU | 0.4 | — | 0.1 | — | — | 0.5 |
| – international organisations | 2.7 | — | — | — | — | 2.7 |
| – multilateral development banks | — | — | 0.2 | — | — | 0.2 |
| – other items | 2.9 | 4.7 | 0.4 | 1.3 | 0.2 | 9.5 |
| Total at 31 Dec 2016 | 657.4 | 779.6 | 80.9 | 278.7 | 31.0 | 1,827.6 |

Table 54: Credit risk RWAs – by geographical region

| | RWAs | | | | | |
|--|--------|-------|------|---------------|---------------|-------|
| | Europe | Asia | MENA | North America | Latin America | Total |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB advanced approach | 149.9 | 208.8 | 7.1 | 83.7 | 5.9 | 455.4 |
| – central governments and central banks | 3.4 | 14.8 | 5.1 | 5.3 | 5.3 | 33.9 |
| – institutions | 4.9 | 9.9 | 0.6 | 1.9 | 0.3 | 17.6 |
| – corporates | 114.2 | 157.3 | 1.4 | 65.0 | 0.3 | 338.2 |
| – total retail | 27.4 | 26.8 | — | 11.5 | — | 65.7 |
| – of which: | — | — | — | — | — | — |
| secured by mortgages on immovable property SME | 0.4 | — | — | 0.1 | — | 0.5 |
| secured by mortgages on immovable property non-SME | 7.1 | 16.8 | — | 9.3 | — | 33.2 |
| qualifying revolving retail | 6.8 | 8.1 | — | 1.1 | — | 16.0 |
| other SME | 5.8 | — | — | 0.1 | — | 5.9 |
| other non-SME | 7.3 | 1.9 | — | 0.9 | — | 10.1 |
| IRB securitisation positions | 13.0 | 0.2 | — | 0.5 | — | 13.7 |
| IRB non-credit obligation assets | 5.3 | 5.4 | 0.4 | 1.3 | 0.8 | 13.2 |
| IRB foundation approach | 18.8 | — | 9.6 | — | — | 28.4 |
| – central governments and central banks | — | — | — | — | — | — |
| – institutions | — | — | 0.1 | — | — | 0.1 |
| – corporates | 18.8 | — | 9.5 | — | — | 28.3 |
| Standardised approach | 38.9 | 69.8 | 30.6 | 15.7 | 19.5 | 174.5 |
| – central governments and central banks | 3.2 | 1.5 | 0.7 | 5.9 | 1.4 | 12.7 |
| – institutions | 0.2 | 0.1 | 0.8 | 0.0 | 0.1 | 1.2 |
| – corporates | 20.0 | 19.3 | 21.0 | 5.8 | 12.2 | 78.3 |
| – retail | 1.0 | 6.5 | 4.3 | 1.3 | 3.4 | 16.5 |
| – secured by mortgages on immovable property | 2.6 | 5.5 | 1.2 | 0.4 | 0.7 | 10.4 |
| – exposures in default | 1.3 | 0.6 | 1.3 | 0.3 | 0.4 | 3.9 |
| – regional governments or local authorities | — | — | 0.7 | — | 0.3 | 1.0 |
| – public sector entities | — | — | — | — | 0.1 | 0.1 |
| – equity | 2.6 | 31.8 | 0.2 | 1.0 | 0.5 | 36.1 |
| – items associated with particularly high risk | 5.1 | — | 0.1 | 0.4 | 0.1 | 5.7 |
| – securitisation positions | 0.3 | 1.1 | — | — | 0.2 | 1.6 |
| – claims in the form of CIU | 0.6 | — | — | — | — | 0.6 |
| – international organisations | — | — | — | — | — | — |
| – multilateral development banks | — | — | — | — | — | — |
| – other items | 2.0 | 3.4 | 0.3 | 0.6 | 0.1 | 6.4 |
| Total at 31 Dec 2017 | 225.9 | 284.2 | 47.7 | 101.2 | 26.2 | 685.2 |

Pillar 3 Disclosures at 31 December 2017

Table 54: Credit risk RWAs – by geographical region (continued)

| | RWAs | | | | | |
|--|--------|-------|------|---------------|---------------|-------|
| | Europe | Asia | MENA | North America | Latin America | Total |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| IRB advanced approach | 127.1 | 192.4 | 7.4 | 99.1 | 4.5 | 430.5 |
| – central governments and central banks | 3.9 | 15.9 | 5.3 | 6.4 | 3.9 | 35.4 |
| – institutions | 3.2 | 9.4 | 0.4 | 1.6 | 0.4 | 15.0 |
| – corporates | 98.4 | 143.4 | 1.7 | 70.3 | 0.2 | 314.0 |
| – total retail | 21.6 | 23.7 | — | 20.8 | — | 66.1 |
| – of which: | | | | | | |
| secured by mortgages on immovable property SME | 0.2 | — | — | 0.1 | — | 0.3 |
| secured by mortgages on immovable property non-SME | 6.0 | 14.1 | — | 16.4 | — | 36.5 |
| qualifying revolving retail | 5.4 | 8.2 | — | 1.1 | — | 14.7 |
| other SME | 4.4 | — | — | 0.1 | — | 4.5 |
| other non-SME | 5.6 | 1.4 | — | 3.1 | — | 10.1 |
| IRB securitisation positions | 20.5 | 0.1 | 0.0 | 0.3 | — | 20.9 |
| IRB non-credit obligation assets | 4.8 | 5.1 | 0.3 | 1.3 | 0.6 | 12.1 |
| IRB foundation approach | 16.1 | — | 9.8 | — | — | 25.9 |
| – central governments and central banks | — | — | — | — | — | — |
| – institutions | — | — | 0.1 | — | — | 0.1 |
| – corporates | 16.1 | — | 9.7 | — | — | 25.8 |
| Standardised approach | 37.3 | 62.4 | 31.5 | 17.9 | 17.2 | 166.3 |
| – central governments and central banks | 3.1 | 1.5 | 0.7 | 8.2 | 1.2 | 14.7 |
| – institutions | 0.1 | 0.2 | 0.6 | 0.1 | — | 1.0 |
| – corporates | 21.0 | 17.2 | 21.2 | 5.0 | 10.6 | 75.0 |
| – retail | 1.4 | 5.9 | 4.8 | 1.1 | 3.1 | 16.3 |
| – secured by mortgages on immovable property | 2.0 | 4.9 | 1.3 | 0.5 | 0.6 | 9.3 |
| – exposures in default | 1.3 | 0.5 | 1.5 | 0.6 | 0.4 | 4.3 |
| – regional governments or local authorities | — | — | 0.6 | — | 0.3 | 0.9 |
| – public sector entities | — | — | — | — | — | — |
| – equity | 2.7 | 29.1 | 0.2 | 1.1 | 0.5 | 33.6 |
| – items associated with particularly high risk | 4.2 | 0.0 | 0.2 | 0.6 | 0.1 | 5.1 |
| – securitisation positions | — | 0.7 | — | — | 0.2 | 0.9 |
| – claims in the form of CIU | 0.4 | 0.0 | 0.1 | — | — | 0.5 |
| – international organisations | — | — | — | — | — | — |
| – multilateral development banks | — | — | — | — | — | — |
| – other items | 1.1 | 2.4 | 0.3 | 0.7 | 0.2 | 4.7 |
| Total at 31 Dec 2016 | 205.8 | 260.0 | 49.0 | 118.6 | 22.3 | 655.7 |

Table 55: IRB exposure – credit risk mitigation

At 31 Dec 2017

| | Footnote | Exposures unsecured: amount | Exposures carrying secured: amount | Exposures secured by collateral | Exposures secured by financial guarantees | Exposures secured by credit derivatives |
|----------------------------------|----------|-----------------------------|------------------------------------|---------------------------------|---|---|
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| Exposures under the IRB advanced | 1 | | | | | |

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| | | | | | |
|--|---------|-------|-------|-------|------|
| approach | | | | | |
| Central governments and central banks | 289.2 | 18.9 | 18.1 | 0.8 | — |
| Institutions | 82.0 | 12.3 | 5.9 | 1.5 | 4.9 |
| Corporates | 539.5 | 378.7 | 273.5 | 97.2 | 8.0 |
| Retail | 188.3 | 279.3 | 256.6 | 22.7 | — |
| Total | 1,099.0 | 689.2 | 554.1 | 122.2 | 12.9 |
| Exposures under the IRB foundation | 1 | | | | |
| approach | | | | | |
| Central governments and central banks | — | — | — | — | — |
| Institutions | 0.2 | — | — | — | — |
| Corporates | 64.4 | 8.8 | 6.4 | 2.4 | — |
| Total | 64.6 | 8.8 | 6.4 | 2.4 | — |

1 This table includes both on and off balance sheet exposures

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Table 56: Standardised exposure – credit risk mitigation
At 31 Dec 2017

| | Footnote | Exposures unsecured: amount \$bn | Exposures carrying secured: amount \$bn | Exposures secured by collateral \$bn | Exposures secured by financial guarantees \$bn | Exposures secured by credit derivatives \$bn |
|--|----------|----------------------------------|---|--------------------------------------|--|--|
| Exposures under the standardised approach | 1 | | | | | |
| Central governments and central banks | 2 | 187.8 | 5.3 | 0.3 | 5.0 | — |
| Institutions | | 2.4 | 1.1 | — | 1.1 | — |
| Corporates | | 130.8 | 41.5 | 32.0 | 9.5 | — |
| Retail | | 68.0 | 2.6 | 1.4 | 1.2 | — |
| Secured by mortgages on immovable property | | 9.4 | 19.6 | 19.6 | — | — |
| Exposures in default | | 2.9 | 0.5 | 0.5 | — | — |
| Items associated with particularly high risk | 3 | 1.3 | 0.1 | — | 0.1 | — |
| Total | | 402.6 | 70.7 | 53.8 | 16.9 | — |

1 This table includes both on and off balance sheet exposures

2 Deferred tax assets are excluded from the exposure.

3 Equities are excluded from the exposure.

Table 57: Standardised exposure – by credit quality step

| | At 31 Dec 2017 | | | At 31 Dec 2016 | | |
|---------------------------------------|-------------------------------------|---------------------|-----------|-------------------------------------|---------------------|-----------|
| | Original exposure ¹ \$bn | Exposure value \$bn | RWAs \$bn | Original exposure ¹ \$bn | Exposure value \$bn | RWAs \$bn |
| Central governments and central banks | | | | | | |
| Credit quality step 1 | 190.6 | 196.3 | | 154.8 | 158.3 | |
| Credit quality step 2 | 0.8 | 1.2 | | 1.3 | 1.6 | |
| Credit quality step 3 | 0.9 | 1.1 | | 1.0 | 1.3 | |
| Credit quality step 4 | 0.2 | — | | 0.3 | 0.1 | |
| Credit quality step 5 | 0.4 | 0.4 | | 0.3 | 0.3 | |
| Credit quality step unrated | 5.2 | 5.2 | | 5.7 | 5.7 | |
| | 198.1 | 204.2 | 12.7 | 163.4 | 167.3 | 14.6 |
| Institutions | | | | | | |
| Credit quality step 1 | 0.4 | 0.4 | | 0.8 | 0.8 | |
| Credit quality step 2 | 2.8 | 1.8 | | 0.6 | 0.3 | |
| Credit quality step 4 | — | — | | 0.5 | 0.5 | |
| Credit quality step 5 | — | — | | 0.1 | 0.1 | |
| Credit quality step unrated | 0.3 | 0.3 | | 0.3 | 0.3 | |
| | 3.5 | 2.5 | 1.2 | 2.3 | 2.0 | 0.9 |
| Corporates | | | | | | |
| Credit quality step 1 | 3.4 | 3.7 | | 2.0 | 2.2 | |
| Credit quality step 2 | 5.2 | 3.7 | | 4.6 | 2.9 | |
| Credit quality step 3 | 1.9 | 1.9 | | 2.6 | 1.7 | |
| Credit quality step 4 | 1.7 | 1.4 | | 4.5 | 3.0 | |
| Credit quality step 5 | 0.3 | 0.2 | | 1.0 | 0.5 | |
| Credit quality step 6 | 0.3 | 0.3 | | 0.4 | 0.1 | |

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| | | | | | | |
|-----------------------------|-------|------|------|-------|------|------|
| Credit quality step unrated | 160.0 | 72.4 | | 145.3 | 67.9 | |
| | 172.8 | 83.6 | 78.3 | 160.4 | 78.3 | 75.0 |

1 Figures presented on an 'obligor basis'.

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Pillar 3 Disclosures at 31 December 2017

Table 58: Changes in stock of general and specific credit risk adjustments

| | Accumulated specific credit risk adjustments \$bn | Accumulated general credit risk adjustments \$bn |
|---|---|--|
| 1 Opening balance at 31 Dec 2016 | 8.6 | — |
| 2 Increases due to amounts set aside for estimated loan losses during the period | 4.7 | — |
| 3 Decreases due to amounts reversed for estimated loan losses during the period | (2.7) |)— |
| 4 Decreases due to amounts taken against accumulated credit risk adjustments | (3.2) |)— |
| Recoveries on credit risk adjustments written off in previous years ¹ | 0.6 | — |
| 5 Transfers between credit risk adjustments | — | — |
| 6 Impact of exchange rate differences | — | — |
| 7 Business combinations, including acquisitions and disposals of subsidiaries | — | — |
| 8 Other adjustments | 0.1 | — |
| 9 Closing balance at 31 Dec 2017 | 8.1 | — |
| 10 Recoveries on credit risk adjustments recorded directly to the statement of profit or loss | — | — |
| 11 Specific credit risk adjustments directly recorded to the statement of profit or loss | — | — |

Under IAS 39 HSBC follows a disclosure convention where recoveries on credit risk adjustment written off in 1 previous years are first added back into accumulated credit risk adjustments before being released to the statement of profit and loss.

Table 59: Changes in stock of defaulted loans and debt securities

| | Footnote | Gross carrying value \$bn |
|---|----------|------------------------------------|
| 1 Defaulted loans and debt securities at 31 Dec 2016 | | 17.9 |
| 2 Loans and debt securities that have defaulted since the last reporting period | | 6.4 |
| 3 Returned to non-defaulted status | | (2.0) |
| 4 Amounts written off | | (2.6) |
| 5 Other changes | 1 | (0.8) |
| 7 Repayments | | (3.8) |
| 6 Defaulted loans and debt securities at 31 Dec 2017 | | 15.1 |

1 Other changes include foreign exchange and assets held for sale in default.

Table 60: IRB – Credit risk exposures by portfolio and PD range

| PD scale | Original on-balance sheet exposure | Off-balance sheet exposures pre-CCF | Average CCF | EAD post-CRM and post-CCF | Average PD | Number of obligors | Average LGD | Average maturity | RWAs | RWA density | Expected loss | Value adjustment and provisions |
|---|------------------------------------|-------------------------------------|-------------|---------------------------|------------|--------------------|-------------|------------------|------|-------------|---------------|---------------------------------|
| | \$bn | \$bn | % | \$bn | % | | % | years | \$bn | % | \$bn | \$bn |
| AIRB – Central government and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | 292.5 | 2.1 | 39.8 | 294.3 | 0.02 | 255 | 42.5 | 2.07 | 24.8 | 8.4 | — | |
| 0.15 to <0.25 | 2.2 | — | 43.0 | 2.3 | 0.22 | 8 | 42.8 | 1.71 | 0.9 | 39.1 | — | |
| 0.25 to <0.50 | 2.2 | — | 74.3 | 2.3 | 0.37 | 11 | 45.0 | 1.15 | 1.1 | 48.4 | — | |
| 0.50 to <0.75 | 2.5 | — | — | 2.6 | 0.63 | 11 | 45.0 | 1.40 | 1.7 | 67.5 | — | |
| 0.75 to <2.50 | 5.9 | — | 28.5 | 5.7 | 1.62 | 54 | 45.0 | 1.11 | 5.3 | 93.2 | 0.1 | |
| 2.50 to <10.00 | 0.5 | 0.2 | 1.5 | — | 4.35 | 12 | 45.1 | 4.70 | 0.1 | 179.5 | — | |
| 10.00 to <100.00 | — | — | — | — | — | — | — | — | — | — | — | |
| 100.00 (Default) | — | — | — | — | — | — | — | — | — | — | — | |
| Sub-total | 305.8 | 2.3 | 38.1 | 307.2 | 0.06 | 351 | 42.6 | 2.04 | 33.9 | 11.0 | 0.1 | — |
| AIRB – Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 71.5 | 10.6 | 45.9 | 76.9 | 0.05 | 2,857 | 40.9 | 1.35 | 11.2 | 14.6 | — | |
| 0.15 to <0.25 | 2.2 | 1.0 | 40.9 | 2.6 | 0.22 | 344 | 45.3 | 1.20 | 1.1 | 41.4 | — | |
| 0.25 to <0.50 | 3.3 | 0.5 | 47.1 | 3.5 | 0.37 | 270 | 44.7 | 0.82 | 1.9 | 54.5 | — | |
| 0.50 to <0.75 | 2.2 | 0.7 | 44.3 | 2.5 | 0.63 | 192 | 41.8 | 1.32 | 1.8 | 69.3 | — | |
| 0.75 to <2.50 | 1.2 | 0.7 | 47.6 | 1.5 | 1.15 | 282 | 46.1 | 1.52 | 1.5 | 98.2 | — | |
| 2.50 to <10.00 | 0.4 | — | 19.2 | — | 4.35 | 54 | 45.8 | 0.55 | — | 144.7 | — | |
| 10.00 to <100.00 | — | 0.1 | 23.2 | — | 12.61 | 32 | 50.0 | 1.29 | 0.1 | 239.0 | — | |
| 100.00 (Default) | — | — | — | — | 100.00 | 2 | 76.7 | 1.00 | — | 81.2 | — | |
| Sub-total | 80.8 | 13.6 | 45.4 | 87.0 | 0.11 | 4,033 | 41.3 | 1.33 | 17.6 | 20.2 | — | — |

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AIRB –
Corporate –
Specialised
Lending
(excluding
Slotting)¹

| | | | | | | | | | | | | |
|---------------------|-----|-----|------|-----|--------|-------|------|------|-----|-----|-----|---|
| 0.00 to <0.15 | 1.4 | 1.1 | 34.3 | 1.8 | 0.10 | 409 | 30.1 | 3.31 | 0.5 | 26 | — | |
| 0.15 to <0.25 | 1.5 | 0.8 | 30.9 | 1.6 | 0.22 | 431 | 32.3 | 3.91 | 0.7 | 44 | — | |
| 0.25 to <0.50 | 0.9 | 0.3 | 43.4 | 1.0 | 0.37 | 232 | 32.4 | 3.55 | 0.6 | 54 | — | |
| 0.50 to <0.75 | 0.9 | 0.2 | 51.8 | 1.0 | 0.63 | 254 | 23.3 | 4.18 | 0.5 | 52 | — | |
| 0.75 to <2.50 | 1.9 | 0.8 | 47.4 | 2.3 | 1.33 | 487 | 30.1 | 3.55 | 1.7 | 79 | — | |
| 2.50 to <10.00 | 0.4 | 0.1 | 36.2 | 0.5 | 4.85 | 232 | 23.8 | 3.24 | 0.4 | 87 | — | |
| 10.00 to <100.00 | 0.3 | 0.1 | 46.0 | 0.3 | 24.77 | 88 | 22.1 | 3.02 | 0.4 | 127 | — | |
| 100.00 (Default) | 0.1 | 0.2 | 70.7 | 0.3 | 100.00 | 133 | 30.6 | 4.49 | 0.3 | 127 | 0.1 | |
| Sub-total | 7.4 | 3.6 | 40.2 | 8.8 | 4.46 | 2,266 | 29.4 | 3.63 | 5.1 | 59 | 0.1 | — |

AIRB –
Corporate –
Other

| | | | | | | | | | | | | |
|---------------------|-------|-------|------|-------|--------|--------|------|------|-------|-----|-----|-----|
| 0.00 to <0.15 | 105.1 | 155.2 | 38.2 | 202.5 | 0.08 | 9,655 | 40.3 | 2.20 | 45.6 | 23 | 0.1 | |
| 0.15 to <0.25 | 50.9 | 63.9 | 36.3 | 82.0 | 0.22 | 9,463 | 36.5 | 1.92 | 29.6 | 36 | 0.1 | |
| 0.25 to <0.50 | 47.0 | 51.2 | 36.3 | 72.7 | 0.37 | 10,194 | 38.0 | 2.07 | 35.5 | 49 | 0.1 | |
| 0.50 to <0.75 | 45.4 | 41.6 | 32.4 | 57.0 | 0.63 | 9,375 | 37.4 | 1.97 | 34.7 | 61 | 0.1 | |
| 0.75 to <2.50 | 140.5 | 97.9 | 31.9 | 133.5 | 1.37 | 44,281 | 37.7 | 2.05 | 109.3 | 82 | 0.7 | |
| 2.50 to <10.00 | 33.5 | 26.2 | 33.7 | 30.8 | 4.17 | 11,455 | 38.8 | 1.97 | 36.4 | 118 | 0.5 | |
| 10.00 to <100.00 | 5.0 | 3.6 | 39.8 | 4.8 | 21.79 | 2,202 | 37.8 | 1.90 | 8.6 | 179 | 0.4 | |
| 100.00 (Default) | 5.0 | 1.0 | 33.5 | 5.2 | 100.00 | 2,429 | 46.1 | 2.11 | 9.8 | 190 | 2.1 | |
| Sub-total | 432.4 | 440.6 | 35.8 | 588.5 | 1.75 | 99,054 | 38.6 | 2.07 | 309.5 | 53 | 4.1 | 3.4 |

Wholesale
AIRB – Total
at 31 Dec
2017²

| | | | | | | | | | | | |
|-------|-------|------|---------|------|---------|------|------|-------|----|-----|-----|
| 882.5 | 460.1 | 36.1 | 1,047.6 | 1.11 | 105,704 | 40.0 | 2.01 | 379.3 | 37 | 4.3 | 3.4 |
|-------|-------|------|---------|------|---------|------|------|-------|----|-----|-----|

Pillar 3 Disclosures at 31 December 2017

Table 60: IRB – Credit risk exposures by portfolio and PD range (continued)

| PD scale | Original on-balance sheet gross exposure \$bn | Off-balance sheet exposures pre-CCF \$bn | Average CCF % | EAD post-CRM and post-CCF \$bn | Average PD % | Number of obligors | Average LGD % | Average maturity years | RWAs \$bn | RWA density % | Expected loss \$bn | Value adjustment and provision \$bn |
|---|---|--|---------------|--------------------------------|--------------|--------------------|---------------|------------------------|-----------|---------------|--------------------|-------------------------------------|
| AIRB – Secured by mortgages on immovable property SME | | | | | | | | | | | | |
| 0.00 to <0.15 | 0.4 | — | 100.0 | 0.4 | 0.06 | 1,291 | 10.6 | — | — | 2 | — | |
| 0.15 to <0.25 | — | — | 100.0 | — | 0.18 | 1,741 | 17.0 | — | — | 7 | — | |
| 0.25 to <0.50 | 0.2 | — | 100.0 | 0.2 | 0.32 | 5,164 | 16.1 | — | — | 7 | — | |
| 0.50 to <0.75 | 0.1 | — | 117.1 | 0.1 | 0.60 | 3,884 | 26.2 | — | — | 19 | — | |
| 0.75 to <2.50 | 0.3 | — | 149.6 | 0.3 | 1.60 | 11,459 | 27.4 | — | 0.1 | 33 | — | |
| 2.50 to <10.00 | 0.4 | — | 102.0 | 0.4 | 5.06 | 5,183 | 24.3 | — | 0.2 | 60 | — | |
| 10.00 to <100.00 | 0.1 | — | 249.6 | 0.1 | 17.72 | 858 | 26.3 | — | 0.1 | 104 | — | |
| 100.00 (Default) | — | — | 78.2 | — | 100.00 | 1,215 | 24.2 | — | 0.1 | 216 | — | |
| Sub-total | 1.5 | — | 122.5 | 1.5 | 4.26 | 30,795 | 20.8 | — | 0.5 | 35 | — | — |
| AIRB – Secured by mortgages on immovable property non-SME | | | | | | | | | | | | |
| 0.00 to <0.15 | 161.7 | 12.9 | 91.2 | 177.0 | 0.06 | 1,007,985 | 14.6 | — | 9.9 | 6 | — | |
| 0.15 to <0.25 | 26.9 | 1.2 | 81.9 | 28.1 | 0.21 | 121,136 | 16.0 | — | 3.1 | 11 | — | |
| 0.25 to <0.50 | 24.6 | 2.9 | 43.9 | 25.9 | 0.37 | 110,580 | 17.4 | — | 4.3 | 17 | — | |
| 0.50 to <0.75 | 11.2 | 0.4 | 100.2 | 11.7 | 0.63 | 51,845 | 15.7 | — | 2.2 | 19 | — | |
| 0.75 to <2.50 | 21.8 | 1.0 | 72.4 | 22.6 | 1.31 | 98,817 | 17.0 | — | 6.5 | 29 | — | |

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| | | | | | | | | | | | | |
|--|-------|-------|------|-------|--------|------------|------|---|------|-----|-----|-----|
| 2.50 to <10.00 | 5.9 | 0.2 | 96.6 | 6.1 | 4.53 | 27,756 | 11.3 | — | 2.3 | 38 | — | |
| 10.00 to <100.00 | 2.1 | 0.1 | 98.8 | 2.3 | 26.58 | 21,434 | 18.5 | — | 2.8 | 120 | 0.1 | |
| 100.00 (Default) | 2.4 | — | 69.5 | 2.4 | 100.00 | 20,590 | 24.7 | — | 2.1 | 86 | 0.7 | |
| Sub-total | 256.6 | 18.7 | 82.5 | 276.1 | 1.44 | 1,460,143 | 15.3 | — | 33.2 | 12 | 0.8 | 0.3 |
| AIRB – Qualifying revolving retail exposures | | | | | | | | | | | | |
| 0.00 to <0.15 | 5.5 | 68.1 | 47.1 | 37.4 | 0.07 | 12,974,761 | 93.5 | — | 1.7 | 5 | — | |
| 0.15 to <0.25 | 1.4 | 13.2 | 44.0 | 7.2 | 0.21 | 2,294,812 | 94.9 | — | 0.8 | 11 | — | |
| 0.25 to <0.50 | 2.2 | 10.2 | 42.5 | 6.4 | 0.37 | 1,829,719 | 93.6 | — | 1.2 | 19 | — | |
| 0.50 to <0.75 | 2.1 | 4.3 | 49.8 | 4.2 | 0.60 | 1,104,290 | 93.4 | — | 1.1 | 27 | — | |
| 0.75 to <2.50 | 5.8 | 7.1 | 47.9 | 9.0 | 1.39 | 2,143,093 | 91.5 | — | 4.4 | 48 | 0.1 | |
| 2.50 to <10.00 | 3.0 | 1.5 | 59.4 | 3.9 | 4.79 | 773,854 | 89.9 | — | 4.4 | 114 | 0.3 | |
| 10.00 to <100.00 | 0.8 | 0.3 | 58.1 | 1.0 | 30.07 | 281,160 | 91.6 | — | 2.2 | 225 | 0.3 | |
| 100.00 (Default) | 0.1 | — | 12.2 | 0.1 | 100.00 | 33,075 | 83.7 | — | 0.2 | 161 | 0.1 | |
| Sub-total | 20.9 | 104.7 | 46.6 | 69.2 | 1.15 | 21,434,764 | 93.1 | — | 16.0 | 23 | 0.8 | 0.2 |
| AIRB – Other SME | | | | | | | | | | | | |
| 0.00 to <0.15 | 0.1 | 0.2 | 44.9 | 0.2 | 0.09 | 92,804 | 62.2 | — | — | 12 | — | |
| 0.15 to <0.25 | 0.2 | 0.2 | 51.1 | 0.3 | 0.22 | 70,783 | 60.6 | — | 0.1 | 23 | — | |
| 0.25 to <0.50 | 0.4 | 0.4 | 51.4 | 0.6 | 0.38 | 130,411 | 62.9 | — | 0.2 | 33 | — | |
| 0.50 to <0.75 | 0.5 | 0.6 | 67.7 | 0.9 | 0.63 | 164,640 | 61.0 | — | 0.4 | 42 | — | |
| 0.75 to <2.50 | 2.2 | 1.4 | 59.1 | 3.0 | 1.55 | 384,599 | 59.0 | — | 1.7 | 57 | — | |
| 2.50 to <10.00 | 2.5 | 1.2 | 57.3 | 3.2 | 4.80 | 195,235 | 55.4 | — | 2.1 | 67 | 0.1 | |
| 10.00 to <100.00 | 0.5 | 0.2 | 53.6 | 0.6 | 18.36 | 80,752 | 69.8 | — | 0.7 | 112 | 0.1 | |
| 100.00 (Default) | 0.5 | 0.1 | 90.6 | 0.6 | 100.00 | 18,209 | 39.2 | — | 0.7 | 116 | 0.3 | |
| Sub-total | 6.9 | 4.3 | 58.2 | 9.4 | 9.84 | 1,137,433 | 57.7 | — | 5.9 | 63 | 0.5 | 0.3 |

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| | | | | | | | | | | | | | |
|---|-------|-------|------|-------|--------|------------|------|---|------|-----|-----|-----|--|
| AIRB – Other non-SME | | | | | | | | | | | | | |
| 0.00 to <0.15 | 9.2 | 6.5 | 32.2 | 11.9 | 0.08 | 453,740 | 21.9 | — | 0.7 | 6 | — | | |
| 0.15 to <0.25 | 6.5 | 3.6 | 35.6 | 8.1 | 0.21 | 359,875 | 28.2 | — | 1.1 | 13 | — | | |
| 0.25 to <0.50 | 6.3 | 2.7 | 29.4 | 7.3 | 0.37 | 318,434 | 30.5 | — | 1.5 | 21 | — | | |
| 0.50 to <0.75 | 4.8 | 1.4 | 28.4 | 5.3 | 0.61 | 178,341 | 27.3 | — | 1.2 | 24 | — | | |
| 0.75 to <2.50 | 8.5 | 0.7 | 27.9 | 8.9 | 1.34 | 332,213 | 26.5 | — | 3.0 | 33 | — | | |
| 2.50 to <10.00 | 2.9 | 0.9 | 26.1 | 3.2 | 4.24 | 194,512 | 34.4 | — | 1.8 | 57 | 0.1 | | |
| 10.00 to <100.00 | 0.6 | — | 21.2 | 0.6 | 24.44 | 84,817 | 49.3 | — | 0.6 | 107 | 0.1 | | |
| 100.00 (Default) | 0.3 | 0.1 | 11.3 | 0.4 | 100.00 | 40,604 | 46.2 | — | 0.2 | 49 | 0.2 | | |
| Sub-total | 39.1 | 15.9 | 31.5 | 45.7 | 1.83 | 1,962,536 | 27.3 | — | 10.1 | 22 | 0.4 | 0.2 | |
| Retail AIRB – Total at 31 Dec 2017 | 325.0 | 143.6 | 50.0 | 401.9 | 1.64 | 26,025,671 | 31.1 | — | 65.7 | 16 | 2.5 | 1.0 | |

95HSBC Holdings plc Pillar 3 2017

Table 60: IRB – Credit risk exposures by portfolio and PD range (continued)

| PD scale | Original on-balance sheet exposure \$bn | Off-balance sheet exposures pre-CCF \$bn | Average CCF % | EAD post-CRM and post-CCF \$bn | Average PD % | Number of obligors | Average LGD % | Average maturity years | RWAs \$bn | RWA density % | Expected loss \$bn | Value adjustment and provisions \$bn |
|--|--|---|------------------|-----------------------------------|-----------------|--------------------|------------------|---------------------------|--------------|------------------|-----------------------|---|
| FIRB – Central government and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | — | — | — | 0.1 | 0.05 | 1 | 45.0 | 4.48 | — | 31 | — | — |
| 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 | — | — | — | 0.1 | 0.05 | 1 | 45.0 | 4.48 | — | 31 | — | — |
| FIRB – Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 0.2 | — | 0.8 | 0.2 | 0.11 | 4 | 45.0 | 2.13 | 0.1 | 29 | — | — |
| 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 | 0.2 | — | 0.8 | 0.2 | 0.11 | 4 | 45.0 | 2.13 | 0.1 | 29 | — | — |

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| | | | | | | | | | | | | | |
|-----------------------------------|------|------|------|------|--------|--------|------|------|------|-----|-----|-----|--|
| FIRB – Corporate – Other | | | | | | | | | | | | | |
| 0.00 to <0.15 | 9.5 | 12.7 | 44.3 | 14.9 | 0.08 | 1,144 | 45.0 | 2.47 | 4.1 | 27 | — | | |
| 0.15 to <0.25 | 3.0 | 6.1 | 42.1 | 5.6 | 0.22 | 1,259 | 44.1 | 2.33 | 2.7 | 47 | — | | |
| 0.25 to <0.50 | 4.4 | 6.1 | 32.7 | 6.3 | 0.37 | 1,319 | 44.1 | 1.88 | 3.6 | 56 | — | | |
| 0.50 to <0.75 | 3.0 | 4.6 | 24.0 | 4.2 | 0.63 | 1,091 | 42.9 | 2.19 | 3.1 | 75 | — | | |
| 0.75 to <2.50 | 8.5 | 10.0 | 25.8 | 10.7 | 1.36 | 3,663 | 43.1 | 1.75 | 9.7 | 92 | 0.1 | | |
| 2.50 to <10.00 | 2.5 | 2.0 | 30.9 | 3.0 | 4.67 | 1,059 | 43.7 | 2.03 | 4.4 | 144 | 0.1 | | |
| 10.00 to <100.00 | 0.3 | 0.3 | 30.3 | 0.4 | 21.37 | 184 | 41.4 | 1.10 | 0.7 | 192 | — | | |
| 100.00 (Default) | 0.6 | 0.2 | 38.6 | 0.7 | 100.00 | 279 | 43.8 | 1.68 | — | — | 0.3 | | |
| Sub-total | 31.8 | 42.0 | 34.9 | 45.8 | 2.52 | 9,998 | 44.0 | 2.13 | 28.3 | 62 | 0.5 | 0.5 | |
| FIRB – Total at 31 Dec 2017 | 32.0 | 42.0 | 34.9 | 46.1 | 2.51 | 10,003 | 44.0 | 2.13 | 28.4 | 62 | 0.5 | 0.5 | |

¹ Slotting exposures are disclosed in Table 61: Specialised lending.

² The Wholesale AIRB Total includes Non-credit obligation assets amounting to \$56.1bn of Original exposure and EAD, and \$13.2bn of RWAs.

Pillar 3 Disclosures at 31 December 2017

Table 60: IRB – Credit risk exposures by portfolio and PD range (continued)

| PD scale | Original on-balance sheet exposure \$bn | Off-balance sheet exposures pre-CCF \$bn | Average CCF % | EAD post-CRM and post-CCF \$bn | Average PD % | Number of obligors | Average LGD % | Average maturity years | RWA _{As} \$bn | RWA density % | Expected loss \$bn | Value adjustment and provisions \$bn |
|--|---|--|---------------|--------------------------------|--------------|--------------------|---------------|------------------------|------------------------|---------------|--------------------|--------------------------------------|
| AIRB – Central government and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | 326.6 | 1.9 | 60.5 | 327.7 | 0.02 | 417 | 42.9 | 2.05 | 26.0 | 8 | — | |
| 0.15 to <0.25 | 2.2 | — | 27.5 | 2.3 | 0.22 | 19 | 43.9 | 1.48 | 0.8 | 37 | — | |
| 0.25 to <0.50 | 2.0 | — | 42.3 | 2.0 | 0.37 | 33 | 43.5 | 1.36 | 0.9 | 49 | — | |
| 0.50 to <0.75 | 0.5 | — | 50.1 | 0.5 | 0.63 | 15 | 45.0 | 1.49 | 0.4 | 69 | — | |
| 0.75 to <2.50 | 3.7 | 0.1 | 26.7 | 3.7 | 1.35 | 35 | 45.0 | 1.27 | 3.4 | 91 | — | |
| 2.50 to <10.00 | 3.2 | — | 76.5 | 3.2 | 3.49 | 20 | 45.0 | 1.07 | 3.9 | 123 | 0.1 | |
| 10.00 to <100.00 | — | — | 50.2 | — | 10.00 | 4 | 47.0 | 0.55 | — | 189 | — | |
| 100.00 (Default) | — | — | — | — | 100.00 | 11 | 88.0 | 5.00 | — | — | — | |
| Sub-total | 338.2 | 2.0 | 59.1 | 339.4 | 0.07 | 554 | 43.0 | 2.02 | 35.4 | 10 | 0.1 | — |
| AIRB – Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 62.5 | 16.3 | 30.5 | 67.7 | 0.05 | 2,772 | 40.2 | 1.34 | 10.2 | 15 | — | |
| 0.15 to <0.25 | 2.0 | 2.0 | 26.4 | 2.5 | 0.22 | 384 | 44.7 | 0.72 | 0.9 | 37 | — | |
| 0.25 to <0.50 | 2.5 | 0.6 | 30.9 | 2.7 | 0.37 | 278 | 44.9 | 0.69 | 1.5 | 54 | — | |
| 0.50 to <0.75 | 0.8 | 0.2 | 53.1 | 0.9 | 0.63 | 175 | 44.7 | 1.15 | 0.7 | 73 | — | |
| 0.75 to <2.50 | 1.8 | 1.1 | 28.8 | 1.9 | 1.11 | 270 | 42.2 | 0.98 | 1.6 | 83 | — | |
| 2.50 to <10.00 | — | — | 21.7 | — | 4.37 | 57 | 41.7 | 0.37 | — | 161 | — | |
| 10.00 to <100.00 | — | 0.2 | 17.4 | — | 26.64 | 44 | 53.2 | 1.53 | 0.1 | 307 | — | |
| 100.00 (Default) | — | — | — | — | 100.00 | 5 | 45.0 | 2.54 | — | 295 | — | |
| Sub-total | 69.6 | 20.4 | 30.1 | 75.7 | 0.12 | 3,985 | 40.6 | 1.29 | 15 | 20 | — | — |

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AIRB –
Corporate –
Specialised
Lending
(excluding
Slotting)¹

| | | | | | | | | | | | | |
|---------------------|-----|-----|------|-----|--------|-------|------|------|-----|-----|-----|-----|
| 0.00 to <0.15 | 0.9 | 0.4 | 62.7 | 1.2 | 0.13 | 614 | 26.5 | 3.43 | 0.3 | 27 | — | |
| 0.15 to <0.25 | 0.9 | 0.3 | 45.5 | 1.0 | 0.22 | 659 | 25.4 | 3.85 | 0.4 | 36 | — | |
| 0.25 to <0.50 | 0.4 | 0.1 | 58.4 | 0.4 | 0.37 | 296 | 30.7 | 3.73 | 0.2 | 52 | — | |
| 0.50 to <0.75 | 0.4 | 0.1 | 31.0 | 0.4 | 0.63 | 250 | 26.0 | 4.29 | 0.2 | 58 | — | |
| 0.75 to <2.50 | 0.7 | 0.5 | 34.5 | 0.9 | 1.25 | 523 | 40.2 | 3.63 | 0.9 | 105 | — | |
| 2.50 to <10.00 | 0.1 | — | 56.5 | 0.1 | 3.57 | 91 | 26.2 | 4.99 | 0.1 | 102 | — | |
| 10.00 to <100.00 | 0.1 | — | 62.0 | 0.1 | 18.58 | 114 | 27.2 | 1.56 | 0.2 | 134 | — | |
| 100.00 (Default) | 0.1 | — | 94.7 | 0.1 | 100.00 | 159 | 53.3 | 3.22 | — | 11 | 0.1 | |
| Sub-total | 3.6 | 1.4 | 47.7 | 4.2 | 4.36 | 2,706 | 30.3 | 3.66 | 2.3 | 56 | 0.1 | 0.1 |

AIRB –
Corporate –
Other

| | | | | | | | | | | | | |
|---------------------|-------|-------|------|-------|--------|--------|------|------|-------|-----|-----|-----|
| 0.00 to <0.15 | 105.5 | 144.3 | 37.9 | 186.0 | 0.08 | 10,931 | 38.1 | 2.26 | 41.4 | 22 | 0.1 | |
| 0.15 to <0.25 | 39.2 | 55.0 | 38.8 | 67.0 | 0.22 | 9,588 | 39.3 | 2.04 | 26.6 | 40 | 0.1 | |
| 0.25 to <0.50 | 45.3 | 48.8 | 36.4 | 69.6 | 0.37 | 10,306 | 39.2 | 2.08 | 34.9 | 50 | 0.1 | |
| 0.50 to <0.75 | 43.1 | 38.7 | 33.4 | 55.0 | 0.63 | 9,322 | 37.5 | 1.95 | 33.5 | 61 | 0.1 | |
| 0.75 to <2.50 | 120.2 | 89.8 | 31.9 | 123.5 | 1.37 | 42,812 | 37.2 | 2.00 | 99.7 | 81 | 0.6 | |
| 2.50 to <10.00 | 32.7 | 27.3 | 34.4 | 31.9 | 4.59 | 11,786 | 36.5 | 1.99 | 36.3 | 114 | 0.5 | |
| 10.00 to <100.00 | 5.6 | 4.8 | 39.8 | 6.4 | 19.65 | 2,459 | 36.5 | 2.05 | 11.1 | 174 | 0.5 | |
| 100.00 (Default) | 6.0 | 0.8 | 51.5 | 6.4 | 100.00 | 2,583 | 41.9 | 2.24 | 6.0 | 93 | 2.5 | |
| Sub-total | 397.6 | 409.5 | 36.2 | 545.8 | 2.15 | 99,787 | 38.1 | 2.10 | 289.5 | 53 | 4.5 | 3.4 |

Wholesale
AIRB – Total
at 31 Dec
2016

| | | | | | | | | | | | |
|-------|-------|------|---------|------|---------|------|------|-------|----|-----|-----|
| 809.0 | 433.3 | 36.0 | 1,017.0 | 1.27 | 107,032 | 40.0 | 2.00 | 354.3 | 36 | 4.7 | 3.5 |
|-------|-------|------|---------|------|---------|------|------|-------|----|-----|-----|

Table 60: IRB – Credit risk exposures by portfolio and PD range (continued)

| PD scale | Original | Off-balance | EAD | | | Number of obligors | Average LGD | Average maturity | RWAs | RWA density | Expected loss | Value adjusted and provision |
|---|---------------------------|-------------------------------|-------------|-----------------------|------------|--------------------|-------------|------------------|------|-------------|---------------|------------------------------|
| | on-balance sheet exposure | sheet gross exposures pre-CCF | Average CCF | post-CRM and post-CCF | Average PD | | | | | | | |
| | \$bn | \$bn | % | \$bn | % | | % | years | \$bn | % | \$bn | \$bn |
| AIRB – Secured by mortgages on immovable property SME | | | | | | | | | | | | |
| 0.00 to <0.15 | 0.3 | — | 100.0 | 0.4 | 0.07 | 1,249 | 10.5 | — | — | 2 | — | |
| 0.15 to <0.25 | 0.1 | — | 100.0 | 0.1 | 0.17 | 200 | 17.9 | — | — | 7 | — | |
| 0.25 to <0.50 | 0.2 | — | 37.7 | 0.1 | 0.32 | 1,012 | 16.4 | — | — | 10 | — | |
| 0.50 to <0.75 | 0.1 | 0.1 | 100.0 | 0.1 | 0.63 | 585 | 26.0 | — | — | 19 | — | |
| 0.75 to <2.50 | 0.3 | — | 95.0 | 0.3 | 1.63 | 1,792 | 28.9 | — | 0.1 | 29 | — | |
| 2.50 to <10.00 | 0.4 | — | 102.3 | 0.4 | 5.26 | 1,928 | 24.4 | — | 0.2 | 32 | — | |
| 10.00 to <100.00 | 0.1 | — | 86.0 | 0.1 | 17.47 | 414 | 26.5 | — | — | 50 | — | |
| 100.00 (Default) | — | — | 97.8 | — | 100.00 | 138 | 26.2 | — | — | 48 | — | |
| Sub-total | 1.5 | 0.1 | 97.7 | 1.5 | 4.01 | 7,318 | 21.1 | — | 0.3 | 21 | — | — |
| AIRB – Secured by mortgages on immovable property non-SME | | | | | | | | | | | | |
| 0.00 to <0.15 | 137.7 | 11.5 | 92.3 | 151.4 | 0.06 | 900,158 | 14.1 | — | 8.0 | 5 | — | |
| 0.15 to <0.25 | 24.4 | 1.1 | 81.0 | 25.5 | 0.21 | 106,945 | 16.5 | — | 2.7 | 11 | — | |
| 0.25 to <0.50 | 22.0 | 2.3 | 43.8 | 23.1 | 0.37 | 120,044 | 22.0 | — | 4.6 | 20 | — | |
| 0.50 to <0.75 | 12.0 | 0.4 | 96.0 | 12.4 | 0.61 | 56,427 | 15.9 | — | 2.2 | 18 | — | |
| 0.75 to <2.50 | 23.1 | 1.1 | 61.8 | 23.9 | 1.33 | 129,916 | 22.0 | — | 8.8 | 37 | 0.1 | |
| 2.50 to <10.00 | 6.4 | 0.2 | 93.6 | 6.6 | 4.76 | 36,051 | 20.0 | — | 4.7 | 71 | 0.1 | |

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| | | | | | | | | | | | | |
|---------------------|-------|------|------|-------|--------|-----------|------|---|------|-----|-----|-----|
| 10.00 to <100.00 | 2.2 | 0.1 | 98.3 | 2.3 | 27.26 | 24,716 | 27.4 | — | 3.9 | 171 | 0.2 | |
| 100.00 (Default) | 3.8 | — | 78.5 | 3.8 | 100.00 | 35,131 | 39.7 | — | 1.6 | 42 | 1.5 | |
| Sub-total | 231.6 | 16.7 | 82.9 | 249.0 | 2.14 | 1,409,388 | 16.6 | — | 36.5 | 15 | 1.9 | 0.5 |

AIRB –
Qualifying
revolving
retail
exposures

| | | | | | | | | | | | | |
|---------------------|------|------|------|------|--------|------------|------|---|------|-----|-----|-----|
| 0.00 to <0.15 | 4.9 | 62.5 | 47.4 | 34.4 | 0.07 | 11,894,411 | 93.7 | — | 1.5 | 4 | — | |
| 0.15 to <0.25 | 1.3 | 12.0 | 44.0 | 6.5 | 0.21 | 1,824,704 | 95.0 | — | 0.8 | 11 | — | |
| 0.25 to <0.50 | 2.1 | 9.0 | 42.9 | 5.9 | 0.37 | 1,732,829 | 93.3 | — | 1.0 | 17 | — | |
| 0.50 to <0.75 | 2.0 | 4.0 | 50.2 | 3.9 | 0.60 | 1,069,619 | 93.4 | — | 1.0 | 26 | — | |
| 0.75 to <2.50 | 5.5 | 6.6 | 47.3 | 8.6 | 1.39 | 1,991,102 | 91.4 | — | 4.0 | 48 | 0.1 | |
| 2.50 to <10.00 | 2.9 | 1.4 | 57.8 | 3.7 | 4.78 | 679,874 | 89.9 | — | 4.2 | 112 | 0.2 | |
| 10.00 to <100.00 | 0.8 | 0.3 | 55.7 | 0.9 | 28.87 | 268,254 | 91.7 | — | 2.1 | 219 | 0.3 | |
| 100.00 (Default) | 0.1 | — | 6.3 | 0.1 | 100.00 | 26,142 | 36.0 | — | 0.1 | 148 | — | |
| Sub-total | 19.6 | 95.8 | 46.8 | 64.0 | 1.14 | 19,486,935 | 93.1 | — | 14.7 | 23 | 0.6 | 0.2 |

AIRB –
Other SME

| | | | | | | | | | | | | |
|---------------------|-----|-----|------|-----|--------|-----------|------|---|-----|-----|-----|-----|
| 0.00 to <0.15 | 0.1 | 0.1 | 67.4 | 0.2 | 0.10 | 82,891 | 39.9 | — | — | 9 | — | |
| 0.15 to <0.25 | 0.2 | 0.2 | 53.4 | 0.3 | 0.22 | 91,588 | 61.2 | — | 0.1 | 22 | — | |
| 0.25 to <0.50 | 0.3 | 0.4 | 51.2 | 0.6 | 0.38 | 141,288 | 63.1 | — | 0.2 | 32 | — | |
| 0.50 to <0.75 | 0.4 | 0.5 | 66.5 | 0.8 | 0.63 | 157,268 | 58.0 | — | 0.3 | 38 | — | |
| 0.75 to <2.50 | 2.0 | 1.3 | 60.8 | 2.8 | 1.58 | 427,912 | 58.8 | — | 1.5 | 55 | — | |
| 2.50 to <10.00 | 2.3 | 0.8 | 69.9 | 2.8 | 4.90 | 201,537 | 53.6 | — | 1.8 | 64 | 0.1 | |
| 10.00 to <100.00 | 0.5 | 0.1 | 70.1 | 0.6 | 17.66 | 69,516 | 66.6 | — | 0.6 | 106 | 0.1 | |
| 100.00 (Default) | 0.6 | 0.1 | 94.5 | 0.6 | 100.00 | 21,873 | 39.5 | — | — | 3 | 0.3 | |
| Sub-total | 6.4 | 3.5 | 63.4 | 8.7 | 10.84 | 1,193,873 | 56.1 | — | 4.5 | 52 | 0.5 | 0.3 |

AIRB –
Other

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| | | | | | | | | | | | | | |
|-----------------------------|-------|-------|------|-------|--------|------------|------|---|------|-----|-----|-----|--|
| non-SME | | | | | | | | | | | | | |
| 0.00 to <0.15 | 9.5 | 6.1 | 34.4 | 11.9 | 0.07 | 442,581 | 20.0 | — | 0.5 | 5 | — | | |
| 0.15 to <0.25 | 6.0 | 2.7 | 35.8 | 7.3 | 0.20 | 393,748 | 31.2 | — | 1.0 | 14 | — | | |
| 0.25 to <0.50 | 5.4 | 2.9 | 29.6 | 6.3 | 0.36 | 276,509 | 29.9 | — | 1.2 | 19 | — | | |
| 0.50 to <0.75 | 4.0 | 1.2 | 29.1 | 4.5 | 0.60 | 176,642 | 29.3 | — | 1.1 | 24 | — | | |
| 0.75 to <2.50 | 8.7 | 0.6 | 31.7 | 9.1 | 1.37 | 345,838 | 28.9 | — | 3.2 | 35 | — | | |
| 2.50 to <10.00 | 2.8 | 1.0 | 26.8 | 3.2 | 4.31 | 188,614 | 39.5 | — | 1.9 | 61 | 0.1 | | |
| 10.00 to <100.00 | 0.7 | — | 17.1 | 0.8 | 25.11 | 79,970 | 65.7 | — | 1.1 | 138 | 0.1 | | |
| 100.00 (Default) | 0.4 | — | 52.1 | 0.5 | 100.00 | 58,697 | 55.4 | — | 0.1 | 13 | 0.3 | | |
| Sub-total | 37.5 | 14.5 | 32.6 | 43.6 | 2.26 | 1,962,599 | 28.7 | — | 10.1 | 23 | 0.5 | 0.3 | |
| Retail | | | | | | | | | | | | | |
| AIRB – Total at 31 Dec 2016 | 296.6 | 130.6 | 50.3 | 366.8 | 2.19 | 24,060,113 | 32.3 | — | 66.1 | 18 | 3.5 | 1.3 | |

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Pillar 3 Disclosures at 31 December 2017

Table 60: IRB – Credit risk exposures by portfolio and PD range (continued)

| PD scale | Original on-balance sheet exposure \$bn | Off-balance sheet exposures pre-CCF \$bn | Average CCF % | EAD post-CRM and post-CCF \$bn | Average PD % | Number of obligors | Average LGD % | Average maturity years | RWAs \$bn | RWA density % | Expected loss \$bn | Value adjustment and provisions \$bn |
|--|--|---|------------------|-----------------------------------|-----------------|--------------------|------------------|---------------------------|--------------|------------------|-----------------------|---|
| FIRB – Central government and central banks | | | | | | | | | | | | |
| 0.00 to <0.15 | — | — | 75.0 | 0.1 | 0.04 | 1 | 45.0 | 5.00 | — | 32 | — | |
| 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 | — | — | 75.0 | 0.1 | 0.04 | 1 | 45.0 | 5.00 | — | 32 | — | — |
| FIRB – Institutions | | | | | | | | | | | | |
| 0.00 to <0.15 | 0.1 | — | 45.2 | 0.1 | 0.06 | 2 | 45.0 | 2.75 | — | 23 | — | |
| 0.15 to <0.25 | — | — | 20.7 | — | 0.22 | — | 45.0 | 3.82 | — | 62 | — | |
| 0.25 to <0.50 | 0.1 | — | 75.0 | 0.2 | 0.37 | 1 | 45.0 | 1.71 | 0.1 | 55 | — | |
| 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 | 0.2 | — | 46.6 | 0.3 | 0.26 | 3 | 45.0 | 2.09 | 0.1 | 43 | — | — |

| | | | | | | | | | | | | | |
|-----------------------------------|------|------|------|------|--------|--------|------|------|------|-----|-----|-----|--|
| FIRB – Corporate – Other | | | | | | | | | | | | | |
| 0.00 to <0.15 | 8.6 | 12.2 | 40.5 | 13.5 | 0.09 | 1,316 | 44.6 | 2.45 | 3.8 | 28 | — | | |
| 0.15 to <0.25 | 3.1 | 5.7 | 39.2 | 5.3 | 0.22 | 1,303 | 44.9 | 2.22 | 2.4 | 46 | — | | |
| 0.25 to <0.50 | 4.5 | 5.2 | 32.2 | 6.1 | 0.37 | 1,549 | 42.8 | 1.96 | 3.5 | 57 | — | | |
| 0.50 to <0.75 | 3.3 | 5.2 | 30.9 | 4.9 | 0.63 | 1,140 | 43.4 | 1.98 | 3.6 | 72 | — | | |
| 0.75 to <2.50 | 6.7 | 9.7 | 26.5 | 9.0 | 1.35 | 2,817 | 43.1 | 1.67 | 8.3 | 91 | 0.1 | | |
| 2.50 to <10.00 | 2.3 | 2.2 | 28.2 | 2.8 | 4.65 | 1,312 | 42.9 | 1.90 | 3.8 | 138 | 0.1 | | |
| 10.00 to <100.00 | 0.2 | 0.2 | 15.2 | 0.3 | 15.99 | 180 | 41.4 | 0.90 | 0.4 | 175 | — | | |
| 100.00 (Default) | 0.4 | 0.1 | 45.8 | 0.5 | 100.00 | 414 | 44.9 | 1.43 | — | — | 0.2 | | |
| Sub-total | 29.1 | 40.5 | 33.9 | 42.4 | 1.95 | 10,031 | 43.8 | 2.07 | 25.8 | 61 | 0.4 | 0.4 | |
| FIRB – Total at 31 Dec 2016 | 29.3 | 40.5 | 34.0 | 42.8 | 1.94 | 10,035 | 43.8 | 2.1 | 25.9 | 61 | 0.4 | 0.4 | |

¹ Slotting exposures are disclosed in Table 61 Specialised lending.

² The Wholesale AIRB Total includes Non-credit obligation assets amounting to \$51.9bn of Original exposure and EAD, and \$12.1bn of RWAs.

Table 61: Specialised lending on slotting approach¹

| Regulatory categories | Remaining maturity | On-balance sheet | Off-balance sheet | Risk | Exposure | RWAs | Expected |
|-----------------------|---------------------------------|------------------|-------------------|--------|----------|------|----------|
| | | amount | amount | weight | amount | loss | loss |
| | | \$bn | \$bn | % | \$bn | \$bn | \$bn |
| Category 1 | Less than 2.5 years | 12.2 | 1.6 | 50 | 13.2 | 6.7 | — |
| | Equal to or more than 2.5 years | 12.9 | 2.0 | 70 | 14.3 | 10.0 | 0.1 |
| Category 2 | Less than 2.5 years | 3.3 | 0.2 | 70 | 3.3 | 2.4 | — |
| | Equal to or more than 2.5 years | 2.8 | 0.4 | 90 | 3.0 | 2.7 | — |
| Category 3 | Less than 2.5 years | 0.4 | — | 115 | 0.4 | 0.4 | — |
| | Equal to or more than 2.5 years | 0.9 | 0.1 | 115 | 0.8 | 0.9 | — |
| Category 4 | Less than 2.5 years | 0.1 | — | 250 | 0.1 | 0.2 | — |
| | Equal to or more than 2.5 years | 0.1 | — | 250 | 0.1 | 0.3 | — |
| Category 5 | Less than 2.5 years | 0.3 | — | — | 0.6 | — | 0.3 |
| | Equal to or more than 2.5 years | 0.3 | — | — | 0.3 | — | 0.2 |
| Total at 31 Dec 2017 | Less than 2.5 years | 16.3 | 1.8 | | 17.6 | 9.7 | 0.3 |
| | Equal to or more than 2.5 years | 17.0 | 2.5 | | 18.5 | 13.9 | 0.3 |
| Category 1 | Less than 2.5 years | 9.1 | 1.5 | 50 | 9.9 | 5.0 | — |
| | Equal to or more than 2.5 years | 12.6 | 1.5 | 70 | 13.7 | 9.5 | 0.1 |
| Category 2 | Less than 2.5 years | 2.9 | 0.4 | 70 | 3.1 | 2.1 | — |
| | Equal to or more than 2.5 years | 2.8 | 0.1 | 90 | 2.8 | 2.5 | — |
| Category 3 | Less than 2.5 years | 0.5 | — | 115 | 0.5 | 0.6 | — |
| | Equal to or more than 2.5 years | 0.9 | — | 115 | 0.9 | 1.0 | — |
| Category 4 | Less than 2.5 years | 0.3 | — | 250 | 0.3 | 0.8 | — |
| | Equal to or more than 2.5 years | 0.1 | — | 250 | 0.1 | 0.3 | — |
| Category 5 | Less than 2.5 years | 0.5 | — | — | 0.8 | — | 0.5 |
| | Equal to or more than 2.5 years | 0.3 | — | — | 0.4 | — | 0.2 |
| Total at 31 Dec 2016 | Less than 2.5 years | 13.3 | 1.9 | | 14.6 | 8.5 | 0.5 |
| | Equal to or more than 2.5 years | 16.7 | 1.6 | | 17.9 | 13.3 | 0.3 |

High volatility commercial real estate ('HVCRE') exposures and risk weighted assets are not included in the above table. The value of exposures and RWAs under HVCRE was nil at 31 December 2017 (31 Dec 2016: EAD \$0.6bn; RWA \$0.4bn).

Table 62: Analysis of counterparty credit risk (CCR) exposure by approach (excluding centrally cleared exposures)

| | Footnote | Notional | Replacement | Potential future | EEPE | Multiplier | EAD | RWAs |
|------------------|----------|----------|-------------|------------------|------|------------|----------|------|
| | | \$bn | cost | exposure | \$bn | \$bn | post-CRM | \$bn |
| | | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Mark to market | | 14,404.8 | 17.2 | 44.5 | — | — | 61.7 | 25.2 |

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| | | | | | | | |
|----|--|----------|------|------|-----|-------|------|
| 4 | Internal Model Method | 12,898.8 | — | 15.9 | 1.4 | 22.2 | 9.7 |
| | – of which: | | | | | | |
| 6 | derivatives and long settlement transactions | 12,898.8 | — | 15.9 | 1.4 | 22.2 | 9.7 |
| | Financial collateral | | | | | | |
| 9 | comprehensive method (for SFTs) | 677.1 | — | — | — | 47.6 | 8.7 |
| 11 | Total at 31 Dec 2017 | 27,980.7 | 44.5 | 15.9 | 1.4 | 131.5 | 43.6 |

Table 63: Credit valuation adjustment (CVA) capital charge

| | At 31 Dec 2017 | | At 31 Dec 2016 | |
|---|-------------------------|--------------|-------------------------|--------------|
| | EAD post-CRM \$bn | RWAs \$bn | EAD post-CRM \$bn | RWAs \$bn |
| 1 Total portfolios subject to the Advanced CVA capital charge | 9.4 | 2.8 | 12.8 | 3.5 |
| 2– VaR component (including the 3 × multiplier) | | 0.7 | | 0.8 |
| 3– stressed VaR component (including the 3 × multiplier) | | 2.1 | | 2.7 |
| 4 All portfolios subject to the Standardised CVA capital charge | 36.6 | 6.7 | 41.6 | 10.9 |
| 5 Total subject to the CVA capital charge | 46.0 | 9.5 | 54.4 | 14.4 |

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Pillar 3 Disclosures at 31 December 2017

Table 64: Standardised approach – CCR exposures by regulatory portfolio and risk weights

| Risk weight | 0% | 10% | 20% | 50% | 75% | 100% | 150% | Others | Total credit exposure | Of which unrated |
|---|-----|-----|-----|-----|-----|------|------|--------|-----------------------|------------------|
| 1 Central governments and central banks | 7.5 | — | — | — | — | — | — | — | 7.5 | 6.3 |
| 2 Regional government or local authorities | | | | | | | | | | |
| 3 Public sector entities | | | | | | | | | | |
| 4 Multilateral development banks | | | | | | | | | | |
| 5 International organisations | | | | | | | | | | |
| 6 Institutions | — | — | — | 0.1 | — | — | — | — | 0.1 | 0.1 |
| 7 Corporates | — | — | — | — | — | 1.9 | — | — | 1.9 | 1.7 |
| 8 Retail | | | | | | | | | | |
| 9 Institutions and corporates with a short-term credit assessment | | | | | | | | | | |
| 10 Other items | | | | | | | | | | |
| Total at 31 Dec 2017 | 7.5 | — | — | 0.1 | — | 1.9 | — | — | 9.5 | 8.1 |
| 1 Central governments and central banks | 7.3 | — | — | — | — | — | — | — | 7.3 | 4.3 |
| 2 Regional government or local authorities | | | | | | | | | | |
| 3 Public sector entities | | | | | | | | | | |
| 4 Multilateral development banks | | | | | | | | | | |
| 5 International organisations | | | | | | | | | | |
| 6 Institutions | — | — | — | 0.2 | — | — | — | — | 0.2 | 0.2 |
| 7 Corporates | — | — | — | 0.1 | — | 2.5 | — | — | 2.6 | 2.3 |
| 8 Retail | | | | | | | | | | |
| 9 Institutions and corporates with a short-term credit assessment | | | | | | | | | | |
| 10 Other items | | | | | | | | | | |
| Total at 31 Dec 2016 | 7.3 | — | — | 0.3 | — | 2.5 | — | — | 10.1 | 6.8 |

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Table 65: IRB – CCR exposures by portfolio and PD scale

| PD scale | EAD post-CRMPD \$bn | Average post-CRMPD % | Number of obligors | Average LGD % | Average maturity years | RWAs \$bn | RWA density % |
|--|---------------------------|----------------------------|--------------------|---------------------|---------------------------|--------------|---------------------|
| AIRB – Central Government and Central Banks | | | | | | | |
| 0.00 to <0.15 | 10.9 | 0.03 | 92 | 45.0 | 0.96 | 0.7 | 6 |
| 0.15 to <0.25 | 0.2 | 0.22 | 9 | 45.0 | 2.83 | 0.1 | 49 |
| 0.25 to <0.50 | 0.1 | 0.37 | 5 | 45.0 | 1.96 | — | 58 |
| 0.50 to <0.75 | — | 0.63 | 6 | 45.0 | 1.01 | — | 63 |
| 0.75 to <2.50 | 0.3 | 1.72 | 9 | 45.0 | 1.42 | 0.4 | 102 |
| 2.50 to <10.00 | 1.0 | 3.59 | 2 | 45.0 | 0.46 | 1.2 | 123 |
| 10.00 to <100.00 | — | — | — | — | — | — | — |
| 100.00 (Default) | — | — | — | — | — | — | — |
| Sub-total | 12.5 | 0.42 | 123 | 45.0 | 1.00 | 2.4 | 19 |
| AIRB – Institutions | | | | | | | |
| 0.00 to <0.15 | 46.8 | 0.06 | 3,973 | 45.3 | 1.34 | 9.8 | 21 |
| 0.15 to <0.25 | 3.9 | 0.22 | 331 | 46.1 | 1.55 | 2.0 | 50 |
| 0.25 to <0.50 | 2.1 | 0.37 | 93 | 45.0 | 1.13 | 1.3 | 59 |
| 0.50 to <0.75 | 0.7 | 0.63 | 91 | 46.3 | 1.24 | 0.5 | 76 |
| 0.75 to <2.50 | 0.7 | 1.23 | 164 | 45.4 | 1.41 | 0.7 | 107 |
| 2.50 to <10.00 | — | 6.00 | 22 | 25.7 | 1.75 | 0.1 | 187 |
| 10.00 to <100.00 | — | 12.67 | 13 | 54.7 | 2.57 | — | 279 |
| 100.00 (Default) | — | 100.00 | 1 | 45.0 | 1.00 | — | — |
| Sub-total | 54.2 | 0.12 | 4,688 | 45.4 | 1.34 | 14.4 | 27 |
| AIRB – Corporates | | | | | | | |
| 0.00 to <0.15 | 31.4 | 0.07 | 5,025 | 44.2 | 1.84 | 7.2 | 23 |
| 0.15 to <0.25 | 5.8 | 0.22 | 1,726 | 47.9 | 1.40 | 2.7 | 46 |
| 0.25 to <0.50 | 3.8 | 0.37 | 1,053 | 45.3 | 2.09 | 2.4 | 62 |
| 0.50 to <0.75 | 2.9 | 0.63 | 936 | 46.0 | 1.38 | 2.1 | 76 |
| 0.75 to <2.50 | 6.8 | 1.36 | 3,065 | 45.8 | 1.48 | 6.9 | 102 |
| 2.50 to <10.00 | 0.6 | 4.53 | 566 | 46.3 | 1.99 | 1.0 | 152 |
| 10.00 to <100.00 | 0.1 | 20.58 | 86 | 47.3 | 1.20 | 0.2 | 263 |
| 100.00 (Default) | 0.1 | 100.00 | 22 | 43.4 | 4.41 | — | — |
| Sub-total | 51.5 | 0.65 | 12,479 | 45.0 | 1.74 | 22.5 | 44 |
| AIRB – Total at 31 Dec 2017 | 118.2 | 0.45 | 17,290 | 53.4 | 1.30 | 39.3 | 33 |
| FIRB – Corporates | | | | | | | |
| 0.00 to <0.15 | 2.3 | 0.07 | 520 | 40.3 | 1.98 | 0.6 | 25 |
| 0.15 to <0.25 | 0.3 | 0.22 | 159 | 45.0 | 1.78 | 0.1 | 44 |
| 0.25 to <0.50 | 0.2 | 0.37 | 151 | 45.0 | 1.75 | 0.1 | 59 |
| 0.50 to <0.75 | 0.1 | 0.63 | 97 | 45.0 | 1.93 | 0.1 | 75 |
| 0.75 to <2.50 | 0.7 | 1.55 | 516 | 45.0 | 1.61 | 0.8 | 114 |
| 2.50 to <10.00 | 0.1 | 4.38 | 82 | 45.0 | 1.64 | 0.1 | 142 |
| 10.00 to <100.00 | — | 10.22 | 9 | 45.0 | 1.00 | — | 187 |
| 100.00 (Default) | — | 100.00 | 5 | 45.0 | 1.10 | — | — |
| FIRB – Total at 31 Dec 2017 | 3.7 | 0.54 | 1,539 | 45.0 | 1.99 | 1.8 | 50 |

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| | | | | | | | |
|---------------------------------------|-------|------|--------|------|--------|------|----|
| Total (all portfolios) at 31 Dec 2017 | 121.9 | 0.38 | 18,829 | 45.0 | 546.39 | 41.1 | 34 |
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Pillar 3 Disclosures at 31 December 2017

Table 65: IRB – CCR exposures by portfolio and PD scale (continued)

| PD scale | EAD post-CRMPD \$bn | Average CRMPD % | Number of obligors | Average LGD % | Average maturity years | RWAs \$bn | RWA density % |
|--|---------------------------|-----------------------|--------------------|---------------------|---------------------------|--------------|---------------------|
| AIRB – Central Government and Central Banks | | | | | | | |
| 0.00 to <0.15 | 11.7 | 0.04 | 104 | 45.3 | 1.00 | 1.1 | 8 |
| 0.15 to <0.25 | 0.2 | 0.22 | 4 | 45.0 | 1.00 | 0.1 | 32 |
| 0.25 to <0.50 | — | 0.37 | 5 | 45.0 | 0.20 | — | 38 |
| 0.50 to <0.75 | — | 0.63 | 5 | 45.0 | 0.20 | — | 55 |
| 0.75 to <2.50 | — | 1.34 | 12 | 41.2 | 2.80 | — | 111 |
| 2.50 to <10.00 | 0.4 | 4.20 | 3 | 45.0 | 0.90 | 0.5 | 125 |
| 10.00 to <100.00 | — | — | — | — | — | — | — |
| 100.00 (Default) | — | — | — | — | — | — | — |
| Sub-total | 12.3 | 0.19 | 133 | 45.3 | 1.00 | 1.7 | 13 |
| AIRB – Institutions | | | | | | | |
| 0.00 to <0.15 | 48.5 | 0.06 | 3,473 | 45.2 | 1.30 | 10.8 | 22 |
| 0.15 to <0.25 | 5.9 | 0.22 | 295 | 46.9 | 1.60 | 3.0 | 51 |
| 0.25 to <0.50 | 1.6 | 0.37 | 133 | 45.0 | 1.40 | 0.9 | 61 |
| 0.50 to <0.75 | 0.7 | 0.63 | 69 | 45.0 | 0.60 | 0.5 | 70 |
| 0.75 to <2.50 | 0.6 | 1.07 | 144 | 45.1 | 1.50 | 0.6 | 104 |
| 2.50 to <10.00 | 0.1 | 4.64 | 31 | 45.0 | 2.30 | 0.1 | 186 |
| 10.00 to <100.00 | 0.1 | 28.13 | 17 | 53.4 | 2.10 | 0.2 | 329 |
| 100.00 (Default) | — | — | — | — | — | — | — |
| Sub-total | 57.5 | 0.14 | 4,162 | 45.3 | 1.40 | 16.1 | 28 |
| AIRB – Corporates | | | | | | | |
| 0.00 to <0.15 | 30.9 | 0.07 | 5,839 | 41.6 | 1.90 | 7.5 | 24 |
| 0.15 to <0.25 | 7.3 | 0.22 | 1,870 | 46.3 | 1.90 | 3.7 | 51 |
| 0.25 to <0.50 | 3.4 | 0.37 | 1,131 | 47.1 | 1.70 | 2.1 | 62 |
| 0.50 to <0.75 | 3.3 | 0.63 | 968 | 43.3 | 1.40 | 2.6 | 79 |
| 0.75 to <2.50 | 5.7 | 1.35 | 3,112 | 46.3 | 1.40 | 6.1 | 107 |
| 2.50 to <10.00 | 0.7 | 4.24 | 693 | 47.6 | 1.70 | 1.2 | 171 |
| 10.00 to <100.00 | 0.1 | 24.67 | 121 | 49.9 | 2.00 | 0.3 | 300 |
| 100.00 (Default) | 0.1 | 100.00 | 46 | 45.4 | 4.20 | — | — |
| Sub-total | 51.5 | 0.66 | 13,780 | 43.8 | 1.80 | 23.5 | 46 |
| AIRB – Total at 31 Dec 2016 | 121.3 | 34.00 | 18,075 | 44.5 | 1.50 | 41.3 | 34 |
| FIRB – Corporates | | | | | | | |
| 0.00 to <0.15 | 4.2 | 0.06 | 553 | 45.0 | 1.90 | 0.9 | 23 |
| 0.15 to <0.25 | 0.3 | 0.22 | 137 | 45.0 | 2.20 | 0.1 | 48 |
| 0.25 to <0.50 | 0.3 | 0.37 | 160 | 45.0 | 1.70 | 0.2 | 58 |
| 0.50 to <0.75 | 0.4 | 0.63 | 96 | 45.0 | 1.70 | 0.3 | 73 |
| 0.75 to <2.50 | 0.3 | 1.35 | 496 | 45.0 | 2.20 | 0.3 | 108 |
| 2.50 to <10.00 | — | 4.61 | 79 | 45.0 | 2.00 | 0.1 | 151 |
| 10.00 to <100.00 | — | 13.52 | 10 | 45.0 | 1.00 | — | 218 |

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| | | | | | | | |
|---------------------------------------|-------|--------|--------|------|------|------|----|
| 100.00 (Default) | — | 100.00 | 7 | 45.0 | 1.20 | — | — |
| FIRB – Total at 31 Dec 2017 | 5.5 | 0.20 | 1,538 | 45.0 | 1.91 | 1.9 | 35 |
| Total (all portfolios) at 31 Dec 2016 | 126.8 | 0.33 | 19,613 | 44.5 | 1.52 | 43.2 | 34 |

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Table 66: Impact of netting and collateral held on exposure values

| | Gross positive fair value or net carrying amount \$bn | Netting benefits \$bn | Netted current credit exposure \$bn | Collateral held \$bn | Net credit exposure \$bn |
|------------------------|--|--------------------------|--|-------------------------|-----------------------------|
| 1 Derivatives | 628.3 | 469.0 | 159.3 | 41.8 | 117.5 |
| 2 SFTs | 679.3 | — | 679.3 | 633.2 | 46.1 |
| 4 Total at 31 Dec 2017 | 1,307.6 | 469.0 | 838.6 | 675.0 | 163.6 |

Table 67: Composition of collateral for CCR exposure

| | Collateral used in derivative transactions | | | | Collateral used in SFTs | |
|----------------------------|--|----------------------|---------------------------------|----------------------|---|---|
| | Fair value of collateral received | | Fair value of posted collateral | | Fair value of collateral received \$bn | Fair value of posted collateral \$bn |
| | Segregated \$bn | Unsegregated \$bn | Segregated \$bn | Unsegregated \$bn | | |
| 1 Cash – domestic currency | — | 5.9 | 1.4 | 3.5 | 72.6 | 96.3 |
| 2 Cash – other currencies | — | 34.7 | 4.9 | 28.7 | 186.1 | 269.6 |
| 3 Domestic sovereign debt | — | 5.4 | — | 5.3 | 83.3 | 77.1 |
| 4 Other sovereign debt | — | 7.6 | — | 11.2 | 219.9 | 166.6 |
| 5 Government agency debt | — | 0.2 | — | 1.1 | 12.0 | 4.6 |
| 6 Corporate bonds | — | 0.6 | — | 0.4 | 39.2 | 17.1 |
| 7 Equity securities | — | 0.4 | — | — | 46.3 | 45.0 |
| 8 Other collateral | — | 0.2 | — | 0.3 | 1.6 | 1.2 |
| 9 Total at 31 Dec 2017 | — | 55.0 | 6.3 | 50.5 | 661.0 | 677.5 |
| 1 Cash – domestic currency | — | 5.2 | 2.0 | 3.0 | 42.9 | 73.1 |
| 2 Cash – other currencies | — | 38.9 | 4.7 | 32.4 | 148.7 | 227.5 |
| 3 Domestic sovereign debt | — | 4.2 | — | 7.1 | 64.5 | 49.1 |
| 4 Other sovereign debt | — | 8.9 | — | 9.4 | 186.7 | 131.9 |
| 5 Government agency debt | — | 0.3 | — | 0.2 | 7.8 | 2.3 |
| 6 Corporate bonds | — | 0.4 | — | — | 23.7 | 11.1 |
| 7 Equity securities | — | — | — | — | 39.5 | 34.4 |
| 8 Other collateral | — | 0.1 | — | 0.2 | 2.0 | 7.6 |
| 9 Total at 31 Dec 2016 | — | 58.0 | 6.7 | 52.3 | 515.8 | 537.0 |

Table 68: Exposures to central counterparties

| | At 31 Dec 2017 | At 31 Dec 2016 |
|--|----------------|----------------|
| | EAD post-CRM | EAD post-CRM |
| | | RWAs |

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| | \$bn | \$bn | \$bn | \$bn |
|--|------|------|------|------|
| 1 Exposures to QCCPs (total) | 42.3 | 1.4 | 34.0 | 1.2 |
| 2 Exposures for trades at QCCPs (excluding initial margin and default fund contributions) | 28.5 | 0.6 | 20.7 | 0.4 |
| 3 – OTC derivatives | 18.0 | 0.4 | 10.4 | 0.2 |
| 4 – exchange-traded derivatives | 8.1 | 0.2 | 7.2 | 0.1 |
| 5 – securities financing transactions | 2.4 | — | 3.1 | 0.1 |
| 6 – netting sets where cross-product netting has been approved | — | — | — | — |
| 7 Segregated initial margin | 6.3 | — | 6.7 | — |
| 8 Non-segregated initial margin | 7.5 | 0.1 | 6.6 | 0.1 |
| 9 Pre-funded default fund contributions | — | 0.7 | — | 0.7 |
| 10 Unfunded default fund contributions | — | — | — | — |
| 11 Exposures to non-QCCPs (total) | — | — | 0.3 | 0.4 |
| 12 Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions) | — | — | 0.3 | 0.4 |
| 13 – OTC derivatives | — | — | 0.3 | 0.4 |
| 14 – exchange-traded derivatives | — | — | — | — |
| 15 – securities financing transactions | — | — | — | — |
| 16 – netting sets where cross-product netting has been approved | — | — | — | — |
| 17 Segregated initial margin | — | — | — | — |
| 18 Non-segregated initial margin | — | — | — | — |
| 19 Pre-funded default fund contributions | — | — | — | — |
| 20 Unfunded default fund contributions | — | — | — | — |

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| | Bank acts as investor ¹ | | | Bank acts as investor ¹ | | |
|----------------------------|------------------------------------|-----------|-----------|------------------------------------|-----------|-----------|
| | Traditional | Synthetic | Sub-total | Traditional | Synthetic | Sub-total |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 1 Retail (total) | 1.6 | — | 1.6 | 1.5 | — | 1.5 |
| 2 – residential mortgage | 0.9 | — | 0.9 | 0.6 | — | 0.6 |
| 3 – credit card | 0.2 | — | 0.2 | — | — | — |
| 4 – other retail exposures | 0.5 | — | 0.5 | 0.9 | — | 0.9 |
| 5 – re-securitisation | — | — | — | — | — | — |
| 6 Wholesale (total) | 0.9 | — | 0.9 | 1.0 | — | 1.0 |
| 7 – loans to corporates | — | — | — | 0.1 | — | 0.1 |
| 8 – commercial mortgage | 0.6 | — | 0.6 | 0.7 | — | 0.7 |
| 9 – lease and receivables | — | — | — | — | — | — |
| 10 – other wholesale | 0.3 | — | 0.3 | 0.1 | — | 0.1 |
| 11 – re-securitisation | — | — | — | 0.1 | — | 0.1 |
| Total (all portfolios) | 2.5 | — | 2.5 | 2.5 | — | 2.5 |

¹ HSBC does not act as originator or sponsor for securitisation exposures in the trading book.

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Table 71: Securitisation exposures in the non-trading book and associated capital requirements – bank acting as originator or sponsor

| | Exposure values (by risk weight bands) | | | | | Exposure values (by regulatory approach) | | | |
|------------------------------|--|----------------|-----------------|--------------------|------------------------|--|---------|------|--------|
| | ≤20% RW | >20% to 50% RW | >50% to 100% RW | >100% to 1,250% RW | 1,250% RW ¹ | IRB RBM (including IAA) | IRB SFA | SA | 1,250% |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 2 Traditional securitisation | 18.6 | 1.4 | 0.2 | 0.5 | 0.8 | 20.2 | — | 0.6 | 0.8 |
| 3 Securitisation | 18.4 | 0.7 | 0.2 | 0.3 | 0.2 | 19.1 | — | 0.6 | 0.2 |
| 4 – retail underlying | 17.4 | 0.3 | 0.1 | 0.3 | 0.1 | 17.8 | — | 0.3 | 0.1 |
| 5 – wholesale | 1.0 | 0.4 | 0.1 | — | 0.1 | 1.3 | — | 0.3 | 0.1 |
| 6 Re-securitisation | 0.2 | 0.7 | — | 0.2 | 0.6 | 1.1 | — | — | 0.6 |
| 7 – senior | 0.2 | — | — | — | — | 0.1 | — | — | — |
| 8 – non-senior | — | 0.7 | — | 0.2 | 0.6 | 1.0 | — | — | 0.6 |
| 9 Synthetic securitisation | 4.3 | — | 0.4 | — | — | 4.7 | — | — | — |
| 10 Securitisation | 4.3 | — | 0.4 | — | — | 4.7 | — | — | — |
| 11 – retail underlying | — | — | — | — | — | — | — | — | — |
| 12 – wholesale | 4.3 | — | 0.4 | — | — | 4.7 | — | — | — |
| 13 Re-securitisation | — | — | — | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — | — | — | — |
| 1 Total at 31 Dec 2017 | 22.9 | 1.4 | 0.6 | 0.5 | 0.8 | 24.9 | — | 0.6 | 0.8 |
| 2 Traditional securitisation | 16.7 | 2.0 | 0.2 | 0.2 | 4.9 | 18.9 | — | 0.2 | 4.9 |
| 3 Securitisation | 16.7 | 0.4 | 0.1 | 0.1 | — | 17.2 | — | 0.2 | — |
| 4 – retail underlying | 16.7 | 0.4 | 0.1 | 0.1 | — | 17.2 | — | 0.2 | — |
| 5 – wholesale | — | — | — | — | — | — | — | — | — |
| 6 Re-securitisation | — | 1.6 | 0.1 | 0.1 | 4.9 | 1.7 | — | — | 4.9 |
| 7 – senior | — | — | — | — | — | — | — | — | — |
| 8 – non-senior | — | 1.6 | 0.1 | 0.1 | 4.9 | 1.7 | — | — | 4.9 |
| 9 Synthetic securitisation | 4.3 | — | 0.4 | — | — | 4.7 | — | — | — |
| 10 Securitisation | 4.3 | — | 0.4 | — | — | 4.7 | — | — | — |
| 11 – retail underlying | — | — | — | — | — | — | — | — | — |
| 12 – wholesale | 4.3 | — | 0.4 | — | — | 4.7 | — | — | — |
| 13 Re-securitisation | — | — | — | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — | — | — | — |
| 1 Total at 31 Dec 2016 | 21.0 | 2.0 | 0.6 | 0.2 | 4.9 | 23.6 | — | 0.2 | 4.9 |

¹ The movements in 1,250% risk-weighted positions during 2017 are primarily attributable to a change in the presentation of overlapping exposures to Solitaire Funding Limited. Comparatives for 2016 have not been restated.

Pillar 3 Disclosures at 31 December 2017

Table 71: Securitisation exposures in the non-trading book and associated capital requirements – bank acting as originator or sponsor (continued)

| | RWAs (by regulatory approach) | | | Capital charge after cap | | |
|------------------------------|-------------------------------|---------|------------------------|--------------------------|---------|-----------|
| | IRB RBM (including IAA) | IRB SFA | SA 1,250% ¹ | IRB RBM (including IAA) | IRB SFA | SA 1,250% |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 2 Traditional securitisation | 3.3 | — | 0.4 | 0.2 | — | 0.6 |
| 3 Securitisation | 2.3 | — | 0.4 | 0.1 | — | 0.2 |
| 4 – retail underlying | 2.1 | — | 0.3 | 0.1 | — | 0.1 |
| 5 – wholesale | 0.2 | — | 0.1 | — | — | 0.1 |
| 6 Re-securitisation | 1.0 | — | — | 0.1 | — | 0.4 |
| 7 – senior | — | — | — | — | — | — |
| 8 – non-senior | 1.0 | — | — | 0.1 | — | 0.4 |
| 9 Synthetic securitisation | 0.8 | — | — | 0.1 | — | — |
| 10 Securitisation | 0.8 | — | — | 0.1 | — | — |
| 11 – retail underlying | — | — | — | — | — | — |
| 12 – wholesale | 0.8 | — | — | 0.1 | — | — |
| 13 Re-securitisation | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — |
| 1 Total at 31 Dec 2017 | 4.1 | — | 0.4 | 0.3 | — | 0.6 |
| 2 Traditional securitisation | 2.6 | — | 0.2 | 0.2 | — | 1.2 |
| 3 Securitisation | 1.6 | — | 0.2 | 0.1 | — | — |
| 4 – retail underlying | 1.6 | — | 0.2 | 0.1 | — | — |
| 5 – wholesale | — | — | — | — | — | — |
| 6 Re-securitisation | 1.0 | — | — | 0.1 | — | 1.2 |
| 7 – senior | — | — | — | — | — | — |
| 8 – non-senior | 1.0 | — | — | 0.1 | — | 1.2 |
| 9 Synthetic securitisation | 0.9 | — | — | 0.1 | — | — |
| 10 Securitisation | 0.9 | — | — | 0.1 | — | — |
| 11 – retail underlying | — | — | — | — | — | — |
| 12 – wholesale | 0.9 | — | — | 0.1 | — | — |
| 13 Re-securitisation | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — |
| 1 Total at 31 Dec 2016 | 3.5 | — | 0.2 | 0.3 | — | 1.2 |

¹ The movements in 1,250% risk-weighted positions during 2017 are primarily attributable to a change in the presentation of overlapping exposures to Solitaire Funding Limited. Comparatives for 2016 have not been restated.

Table 72: Securitisation exposures in the non-trading book and associated capital requirements – bank acting as investor

| | Exposure values (by risk weight bands) | | | | | Exposure values (by regulatory approach) | | | |
|------------------------------|--|----------------|-----------------|--------------------|-----------|--|---------|-----------|------|
| | ≤20% RW | >20% to 50% RW | >50% to 100% RW | >100% to 1,250% RW | 1,250% RW | IRB RBM (including IAA) | IRB SFA | SA 1,250% | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 2 Traditional securitisation | 6.7 | 0.5 | 1.6 | — | 0.1 | 7.2 | — | 1.4 | 0.1 |
| 3 Securitisation | 6.7 | 0.5 | 1.6 | — | 0.1 | 7.2 | — | 1.4 | 0.1 |
| 4 – retail underlying | 4.5 | 0.4 | 1.1 | — | 0.1 | 4.5 | — | 1.4 | 0.1 |
| 5 – wholesale | 2.2 | 0.1 | 0.5 | — | — | 2.7 | — | — | — |
| 6 Re-securitisation | — | — | — | — | — | — | — | — | — |
| 7 – senior | — | — | — | — | — | — | — | — | — |
| 8 – non-senior | — | — | — | — | — | — | — | — | — |
| 9 Synthetic securitisation | — | — | — | — | — | — | — | — | — |
| 10 Securitisation | — | — | — | — | — | — | — | — | — |
| 11 – retail underlying | — | — | — | — | — | — | — | — | — |
| 12 – wholesale | — | — | — | — | — | — | — | — | — |
| 13 Re-securitisation | — | — | — | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — | — | — | — |
| 1 Total at 31 Dec 2017 | 6.7 | 0.5 | 1.6 | — | 0.1 | 7.2 | — | 1.4 | 0.1 |
| 2 Traditional securitisation | 4.9 | 0.3 | 1.2 | — | 0.1 | 5.6 | — | 0.8 | 0.1 |
| 3 Securitisation | 4.9 | 0.2 | 1.1 | — | 0.1 | 5.4 | — | 0.8 | 0.1 |
| 4 – retail underlying | 2.5 | 0.1 | — | — | 0.1 | 2.4 | — | 0.1 | 0.1 |
| 5 – wholesale | 2.4 | 0.1 | 1.1 | — | — | 3.0 | — | 0.7 | — |
| 6 Re-securitisation | — | 0.1 | 0.1 | — | — | 0.2 | — | — | — |
| 7 – senior | — | — | 0.1 | — | — | 0.1 | — | — | — |
| 8 – non-senior | — | 0.1 | — | — | — | 0.1 | — | — | — |
| 9 Synthetic securitisation | — | — | — | — | — | — | — | — | — |
| 10 Securitisation | — | — | — | — | — | — | — | — | — |
| 11 – retail underlying | — | — | — | — | — | — | — | — | — |
| 12 – wholesale | — | — | — | — | — | — | — | — | — |
| 13 Re-securitisation | — | — | — | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — | — | — | — |
| 1 Total at 31 Dec 2016 | 4.9 | 0.3 | 1.2 | — | 0.1 | 5.6 | — | 0.8 | 0.1 |

Pillar 3 Disclosures at 31 December 2017

Table 72: Securitisation exposures in the non-trading book and associated capital requirements – bank acting as investor
(continued)

| | RWAs (by regulatory approach) | | | | Capital charge after cap | | | |
|------------------------------|-------------------------------|---------|-----------|------|--------------------------|---------|-----------|------|
| | IRB RBM (including IAA) | IRB SFA | SA 1,250% | | IRB RBM (including IAA) | IRB SFA | SA 1,250% | |
| | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn | \$bn |
| 2 Traditional securitisation | 1.9 | — | 1.2 | 0.9 | 0.1 | — | 0.1 | 0.1 |
| 3 Securitisation | 1.9 | — | 1.2 | 0.9 | 0.1 | — | 0.1 | 0.1 |
| 4 – retail underlying | 1.0 | — | 1.2 | 0.7 | — | — | 0.1 | 0.1 |
| 5 – wholesale | 0.9 | — | — | 0.2 | 0.1 | — | — | — |
| 6 Re-securitisation | — | — | — | — | — | — | — | — |
| 7 – senior | — | — | — | — | — | — | — | — |
| 8 – non-senior | — | — | — | — | — | — | — | — |
| 9 Synthetic securitisation | — | — | — | — | — | — | — | — |
| 10 Securitisation | — | — | — | — | — | — | — | — |
| 11 – retail underlying | — | — | — | — | — | — | — | — |
| 12 – wholesale | — | — | — | — | — | — | — | — |
| 13 Re-securitisation | — | — | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — | — | — |
| 1 Total at 31 Dec 2017 | 1.9 | — | 1.2 | 0.9 | 0.1 | — | 0.1 | 0.1 |
| 2 Traditional securitisation | 1.2 | — | 0.7 | 1.3 | 0.1 | — | 0.1 | 0.1 |
| 3 Securitisation | 1.1 | — | 0.7 | 1.1 | 0.1 | — | 0.1 | 0.1 |
| 4 – retail underlying | 0.3 | — | — | 1.0 | — | — | — | 0.1 |
| 5 – wholesale | 0.8 | — | 0.7 | 0.1 | 0.1 | — | 0.1 | — |
| 6 Re-securitisation | 0.1 | — | — | 0.2 | — | — | — | — |
| 7 – senior | — | — | — | — | — | — | — | — |
| 8 – non-senior | 0.1 | — | — | 0.2 | — | — | — | — |
| 9 Synthetic securitisation | — | — | — | — | — | — | — | — |
| 10 Securitisation | — | — | — | — | — | — | — | — |
| 11 – retail underlying | — | — | — | — | — | — | — | — |
| 12 – wholesale | — | — | — | — | — | — | — | — |
| 13 Re-securitisation | — | — | — | — | — | — | — | — |
| 14 – senior | — | — | — | — | — | — | — | — |
| 15 – non-senior | — | — | — | — | — | — | — | — |
| 1 Total at 31 Dec 2016 | 1.2 | — | 0.7 | 1.3 | 0.1 | — | 0.1 | 0.1 |

Appendix II

Asset encumbrance

The following is the disclosure of on-balance sheet encumbered and unencumbered assets, and off-balance sheet collateral (represented by median values of monthly data points in 2017) based on the requirement in Part Eight of CRD IV. The related Guideline, issued by the EBA on 27 June 2014, was implemented by the PRA through Supervisory Statement SS11/14.

Table 73: A – Assets

| | Carrying amount of encumbered assets \$m | Fair value of encumbered assets \$m | Carrying amount of unencumbered assets \$m | Fair value of unencumbered assets \$m |
|---|--|---|--|---|
| 010 Assets of the reporting institution | 165,531 | — | 2,249,300 | — |
| 030 Equity instruments | 24,652 | 24,652 | 71,969 | 71,883 |
| 040 Debt securities | 80,914 | 81,458 | 376,331 | 374,601 |
| 120 Other assets | 3,080 | — | 366,369 | — |

Table 73: B – Collateral received

| | Fair value of encumbered collateral received or own debt securities issued \$m | Fair value of collateral received or own debt securities issued available for encumbrance \$m |
|--|---|---|
| 130 Assets of the reporting institution | 179,125 | 169,547 |
| 150 Equity instruments | 17,111 | 15,663 |
| 160 Debt securities | 162,014 | 153,873 |
| 230 Other collateral received | — | 1,271 |
| 240 Own debt securities issued other than own covered bonds or ABSs | — | — |

Table 73: C – Encumbered assets/collateral received and associated liabilities

| | Matching liabilities, contingent liabilities or securities lent \$m | Assets, collateral received and own debt securities issued other than covered bonds and ABSs encumbered \$m |
|---|---|--|
| 010 Carrying amount of selected financial liabilities | 215,729 | 300,150 |

Importance of encumbrance

We are a deposit-led bank and hence the majority of our funding is from customer current accounts and customer savings deposits payable on demand or at short notice. Given this structural unsecured funding position we have little requirement to fund ourselves in secured markets, and therefore our overall low level of encumbrance reflects this position. However, we do provide collateralised financing services to clients as part of our GB&M business model, providing cash financing or specific securities,

and these result in off-balance sheet encumbrance. The other sources which contribute to encumbrance are securities pledged in derivative transactions, mostly for hedging purposes, issuance of asset-backed securities, and covered bond programmes in France and Australia. HSBC Holdings ALCO reviews the asset encumbrance of the institution as a whole quarterly and any events changing the asset encumbrance level are examined.

For details on balance sheet encumbered and unencumbered assets, please refer to Table 48.

Pillar 3 Disclosures at 31 December 2017

Appendix III

Summary of disclosures withheld

| CRD IV reference | Description | Rationale |
|---------------------|--|---|
| 448(a) | Key assumptions (including assumptions regarding loan prepayments and behaviour of non-maturity deposits) on their exposure to interest rate risk on positions not included in the trading book. | Assumptions regarding fixed term loan repayments and term behaviouralisation of non-maturity deposits and capital drive HSBC's structural interest rates positioning and market hedging requirements. These assumptions are proprietary and their disclosure could give key business strategy information to our competitors. |

Other Information

Abbreviations

The following abbreviated terms are used throughout this document.

Currencies

\$ United States dollar

A

ABCP Asset-backed commercial paper
 ABS¹ Asset-backed security
 AFS¹ Available-for-sale
 AIRB¹ Advanced internal ratings based approach
 ALCM Asset, Liability and Capital Management
 ALCO Asset and Liability Management Committee
 AT1 capital Additional tier 1 capital
 AVA Additional value adjustment

B

BCBS Basel Committee on Banking Supervision

BSM Balance Sheet Management

C

CCB¹ Capital conservation buffer
 CCF¹ Credit conversion factor
 CCP Central counterparty
 CCR¹ Counterparty credit risk
 CCyB¹ Countercyclical capital buffer
 CDS¹ Credit default swap
 CET1¹ Common equity tier 1
 CIU Collective investment undertakings
 CML¹ Consumer and Mortgage Lending (US)
 CRA¹ Credit risk adjustment
 CRD IV¹ Capital Requirements Regulation and Directive
 CRE¹ Commercial real estate
 CRM Credit risk mitigation/mitigant
 CRR¹ Customer risk rating
 CSA¹ Credit Support Annex
 CVA Credit valuation adjustment
 CVC Conduct and Values Committee

D

D-SIB Domestic systemically important bank
 DPA Deferred prosecution agreement

E

EAD¹ Exposure at default
 EBA European Banking Authority
 EC European Commission
 ECA Export Credit Agency
 ECAI¹ External Credit Assessment Institution

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| | |
|--------------------|---|
| EEA | European Economic Area |
| EL ¹ | Expected loss |
| EU | European Union |
| EVE ¹ | Economic value of equity |
| F | |
| FFVA | Funding Fair Value Adjustment |
| FIRB ¹ | Foundation internal ratings based approach |
| Fitch | Fitch Ratings |
| FPC ¹ | Financial Policy Committee (UK) |
| FSB | Financial Stability Board |
| FSVC | Financial System Vulnerabilities Committee |
| G | |
| GAC | Group Audit Committee |
| GB&M | Global Banking and Markets, a global business |
| GMB | Group Management Board |
| GPB | Global Private Banking, a global business |
| GRC | |
| Group | Group Risk Committee |
| G-SIB ¹ | HSBC Holdings together with its subsidiary undertakings |
| G-SII | Global systemically important bank |
| | Global systemically important institution |
| H | |
| HKMA | Hong Kong Monetary Authority |
| 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 |
| I | |
| IAA ¹ | Internal Assessment Approach |
| ICAAP ¹ | Internal Capital Adequacy Assessment Process |
| ICG | Individual capital guidance |
| IFRSs | International Financial Reporting Standards |
| ILAA | Individual Liquidity Adequacy Assessment |
| ILR | Inherent Liquidity Risk |
| IMA | Internal Models Approach |
| IMM ¹ | Internal Model Method |
| IMR | Independent Model Review |
| IRB ¹ | Internal ratings based approach |
| IRC ¹ | Incremental risk charge |
| IRRBB | Interest rate risk in the banking book |
| L | |
| LCR | Liquidity Coverage Ratio |
| LFRF | Liquidity and Funding Risk Framework |
| LGD ¹ | Loss given default |
| Libor | London interbank offered rate |

M

| | |
|------------------|---|
| MDB ¹ | Multilateral Development Bank |
| MENA | Middle East and North Africa |
| MOC | Model Oversight Committee |
| Moody's | Moody's Investor Service |
| MPE | Multiple point of entry |
| MREL | Minimum requirements for own funds and eligible liabilities |

N

| | |
|------|-----------------------------|
| NCOA | Non-credit obligation asset |
| NSFR | Net Stable Funding Ratio |

O

| | |
|------------------|---------------------------------------|
| ORMF | Operational risk management framework |
| OTC ¹ | Over-the-counter |

P

| | |
|------------------|--------------------------------------|
| PD ¹ | Probability of default |
| PFE ¹ | Potential future exposure |
| PIT ¹ | Point-in-time |
| PRA ¹ | Prudential Regulation Authority (UK) |
| PVA ¹ | Prudent valuation adjustment |

Q

| | |
|------|---------------------------------|
| QCCP | Qualifying Central Counterparty |
|------|---------------------------------|

R

| | |
|-------------------------|--|
| RAS | Risk appetite statement |
| RBM ¹ | Ratings Based Method |
| RBWM | Retail Bank and Wealth Management, a global business |
| Retail IRB ¹ | Retail internal ratings based approach |
| RMM | Risk Management Meeting of the GMB |
| RNIV | Risks not in VaR |

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RWA¹ Risk-weighted asset

S

SA/STD¹ Standardised approach

SA-CCR Standardised approach for counterparty credit risk

S&P Standard and Poor's rating agency

SFM¹ Supervisory Formula Method

SFT¹ Securities Financing Transactions

SIC Securities Investment Conduit

SME Small- and medium-sized enterprise

SPE¹ Special Purpose Entity

SRB¹ Systemic Risk Buffer

SSFA/SFA Simplified supervisory formula approach

SVaR Stressed Value at risk

T

TLAC¹ Total Loss Absorbing Capacity

TTC¹ Through-the-cycle

T1 capital Tier 1 capital

T2 capital Tier 2 capital

U

UK United Kingdom

US United States

V

VaR¹ Value at risk

¹ Full definition included in the Glossary published on HSBC website www.hsbc.com

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Cautionary statement regarding forward-looking statements

The Pillar 3 Disclosures at 31 December 2017 contain certain forward-looking statements with respect to HSBC's financial condition, results of operations, capital position and business.

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

Written and/or oral forward-looking statements may also be made in the periodic reports to the US Securities and Exchange Commission, summary financial statements to shareholders, proxy statements, offering circulars and prospectuses, press releases and other written materials, and in oral statements made by HSBC's Directors, officers or employees to third parties, including financial analysts.

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

changes in general economic conditions in the markets in which we operate, such as continuing or deepening recessions and fluctuations in employment beyond those factored into consensus forecasts; changes in foreign exchange rates and interest rates; volatility in equity markets; lack of liquidity in wholesale funding markets; illiquidity and downward price pressure in national real estate markets; adverse changes in central banks' policies with respect to the provision of liquidity support to financial markets; heightened market concerns over sovereign creditworthiness in over-indebted countries; adverse changes in the funding status of public or private defined

benefit pensions; and consumer perception as to the continuing availability of credit and price competition in the market segments we serve;

changes in government policy and regulation, including the monetary, interest rate and other policies of central banks and other regulatory authorities; initiatives to change the size, scope of activities and interconnectedness of financial institutions in connection with the implementation of stricter regulation of financial institutions in key markets worldwide; revised capital and liquidity benchmarks which could serve to deleverage bank balance sheets and lower returns available from the current business model and portfolio mix; imposition of levies or taxes designed to change business mix and risk appetite; the practices, pricing or responsibilities of financial institutions serving their consumer markets; expropriation, nationalisation, confiscation of assets and changes in legislation relating to foreign ownership; changes in bankruptcy legislation in the principal markets in which we operate and the consequences thereof; general changes in government policy that may significantly influence investor decisions; extraordinary government actions as a result of current market turmoil; other unfavourable political or diplomatic developments producing social instability or legal uncertainty which in turn may affect demand for our products and services; the costs, effects and outcomes of product regulatory reviews, actions or litigation, including any additional compliance requirements; and the effects of competition in the markets where we operate including increased competition from non-bank financial services companies, including securities firms; and

factors specific to HSBC, including discretionary RWA growth and our success in adequately identifying the risks we face, such as the incidence of loan losses or delinquency, and managing those risks (through account management, hedging and other techniques). Effective risk management depends on, among other things, our ability through stress testing and other techniques to prepare for events that cannot be captured by the statistical models it uses; our success in addressing operational, legal and regulatory, and litigation challenges; and the other risks and uncertainties we identify in 'top and emerging risks' on pages 95 to 106 of the Annual Report and Accounts 2017.

Contacts

Enquiries relating to HSBC's strategy or operations may be directed to:

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Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

HSBC Holdings plc

By: /s/ Iain J Mackay

Name: Iain J. Mackay

Title: Group Finance Director

Date: 21 February 2018

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