HSBC HOLDINGS PLC
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

For the month of February
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 X Form 40-F .....

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Yes..... No X

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http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

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 WCMR and RBWM are the constituent parts of Global Risk that support the GCRO in overseeing credit risks at the highest level. For this, their major duties comprise: undertaking independent reviews of large and high-risk credit proposals, large exposure policy and reporting oversight of our wholesale and retail credit risk management disciplines, ownership of our credit policy and credit systems programmes, portfolio management oversight 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 Security and Fraud Risk on enhancement of protection against retail product fraud, with Operational Risk on the internal control framework and with Risk Strategy on developing our economic capital model, risk appetite process and stress testing.

> The credit responsibilities of Global Risk are described on page 266 of the Annual Report and Accounts 2013.

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

We operate through a hierarchy of personal credit limit approval authorities, not committee structures. Risk officers of individual operating companies, acting under authorities delegated by their boards and executive bodies within local and Group standards, are accountable for their recommendations and credit approval decisions. Each operating company is responsible for the quality and performance of its credit portfolios, and for monitoring and controlling all credit risks in those portfolios in accordance with Group standards.

Above certain risk-based thresholds established in line with authorities delegated by the Board, Head Office concurrence must be provided for locally-approved facilities before they are extended to the customer. Moreover, risk proposals in certain portfolios - sovereign obligors, banks, some non-bank financial institutions and intra-Group exposures - are approved centrally in Global Risk to facilitate efficient control and the reporting of regulatory large and cross-border exposures.

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. Each major subsidiary typically has some

exposures across this range, and requirements may differ according to jurisdictions in which it operates.

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 41.

Whatever the nature of the exposure, 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, informing judgemental decisions for which individual approvers are ultimately accountable.

In the case of automated decision-making processes, as used in retail credit origination where risk decisions may be taken 'at the point of sale' with no management intervention, that accountability rests with those responsible for the parameters built into those processes/systems and the governance and controls surrounding their use.

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, and any consequent amendments to risk ratings must be promptly implemented.

We constantly seek to improve the quality of our risk management. For central management and reporting purposes, Group IT systems are deployed to process credit risk data efficiently and consistently. A central database is used, which covers substantially all our direct lending exposures and holds the output of risk rating systems Group-wide. This continues to be enhanced in order to deliver, at an increasingly granular level, comprehensive management information in support of business strategy, as well as solutions to evolving regulatory reporting requirements, such as the European common reporting requirements.

Group standards govern the process through which risk rating systems are initially developed, judged fit for purpose, approved and implemented; the conditions under which analytical risk model outcomes can be overridden by 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 and are subject to review and modification in the 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 59.

Credit risk models governance

All new or materially changed IRB models require PRA approval, as set out in more detail on page 41 below. Throughout HSBC, such models fall directly under the remit of the global functional MOCs.

The global functional MOCs are responsible for defining the thresholds above which models require their approval, supporting both internal governance and the PRA approval process, for example if they cover exposures generating

credit risk capital requirements exceeding a prescribed threshold or are otherwise deemed material on grounds of risk, portfolio size, or business type.

The RBWM MOC model materiality thresholds are:

- IRB models exceeding, or estimated to exceed, US$2bn in RWAs;
- application models with annual proposed value of new business sourced through the model exceeding US$2bn for secured lending and US$0.5bn for unsecured lending;
- behavioural models with managed total exposure exceeding US$2bn for secured lending and US$1bn for unsecured lending; and
- provisioning models with impairment change impact exceeding US$0.1bn.

WCMR MOC requires all credit risk models for which it is responsible to be approved by delegated senior managers in WCMR with notification to the MOC which retains the responsibility for oversight. RBWM MOC applies different thresholds depending on model type.

Global Risk utilises HSBC standards for the development, validation, independent review, approval, implementation and performance monitoring of credit risk rating models, and oversight of respective local standards for local models. All models must be reviewed at least annually, or more frequently as the need arises.

Compliance with HSBC standards is subject to examination both by risk oversight and review from within the risk function itself, and by internal audit. While the standards set out minimum general requirements, Global Risk has discretion to approve dispensations exceptionally, and fosters best practice between offices.

The following tables set out credit risk exposure values, RWAs and regulatory capital requirements calculated at 8% of RWAs. Table 12 presents exposure values analysed across geographical regions, tables 13 and 14 respectively RWAs and RWA density by geographical region. Exposure values are allocated to a region based on the country of incorporation of the HSBC subsidiary or associate where the exposure was originated. In table 15, allocation to industry sectors is based on the sectoral classification of the obligor, rather than any guarantor, if applicable. Table 16 shows exposures by period outstanding from the reporting date to the maturity date. The full exposure value is allocated to a residual maturity band based on the contractual end date.

Table 11: Credit risk - summary

	At 31 December 2013				At 31 December 2012			
	Exposure value	Average exposure value	RWAs	Capital required	Exposure value	Average exposure value	RWAs	Capital required

						value		
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
Credit risk analysis by exposure class								
IRB advanced approach ...	1,468.8	1,459.5	521.2	41.6	1,470.0	1,551.2	513.6	41.1
Retail:								
- secured on real estate property	310.7	310.5	105.4	8.4	317.4	310.7	130.8	10.5
- qualifying revolving retail	66.9	64.4	15.4	1.2	64.0	95.6	16.2	1.3
-. SMEs1	18.6	15.8	8.9	0.7	13.1	13.1	6.8	0.5
-. other retail	46.8	55.1	11.0	0.9	60.1	60.3	17.2	1.4
Total retail	443.0	445.8	140.7	11.2	454.6	479.7	171.0	13.7
Central governments and central banks	341.7	343.8	53.0	4.1	355.8	407.4	36.8	2.9
Institutions	130.0	136.0	28.0	2.2	131.1	141.5	27.0	2.2
Corporates	508.7	486.8	279.7	22.5	479.1	465.0	251.6	20.1
Equity	-	0.2	-	-	0.3	0.4	0.9	0.1
Securitisation positions2	45.4	46.9	19.8	1.6	49.1	57.2	26.3	2.1
IRB foundation approach	23.6	20.8	13.6	1.1	19.4	17.7	10.3	0.8
Corporates	23.6	20.8	13.6	1.1	19.4	17.7	10.3	0.8
Standardised approach	667.7	658.7	329.5	26.4	681.5	630.2	374.5	30.0
Central governments and central banks	220.0	192.3	0.7	0.1	177.4	117.1	0.9	0.1
Institutions	35.2	39.2	12.1	1.0	57.5	56.4	19.4	1.6
Corporates	221.8	237.1	202.1	16.2	254.5	259.9	237.3	19.0

Retail	47.7	49.7	36.1	2.9	52.9	53.9	40.1	3.2
Secured on real estate property	50.4	45.9	28.4	2.2	45.3	47.4	24.0	1.9
Past due items	4.1	4.2	5.4	0.4	4.4	4.3	6.0	0.5
Regional governments or local authorities	0.8	1.0	0.8	0.1	1.2	1.2	1.0	0.1
Equity	3.3	3.2	3.5	0.3	2.8	5.7	2.8	0.2
Other items3	84.4	86.1	40.4	3.2	85.5	84.3	43.0	3.4
	2,160.1	2,139.0	864.3	69.1	2,170.9	2,199.1	898.4	71.9

1 The PRA allows exposures to SMEs to be treated under the Retail IRB approach, where the total amount owed to the Group by the counterparty is less than €1m and the customer is not managed individually as a corporate counterparty.
2 Excludes trading book securitisation positions and positions deducted from regulatory capital (that would be risk-weighted at 1,250%).
3 Primarily includes such items as fixed assets, prepayments, accruals and Hong Kong Government certificates of indebtedness.

Key points

- Average exposure secured on real estate property treated under the IRB advanced approach remained stable as growth in the UK and Hong Kong markets has been offset by continued run-off and the sale of loans in the US CML portfolio in North America and the sale of the HFC Bank UK secured loan portfolio in Europe.

- Sale of the US CRS portfolio in 2012 has reduced the average exposure value for qualifying revolving retail exposures treated under the IRB advanced approach.

- Business restructuring for a portfolio of SME exposures in Europe caused a change from the corporate to the retail SME IRB advanced approach, increasing the average exposure for this exposure class.

- Sale of non-real estate exposures in the US CML portfolio in North America has reduced the average exposure for the other retail IRB advanced approach.

- Adoption of the standardised approach for EEA central banks following updated policy guidance in Q4 2012 was the key driver of the increase in average exposure for central governments and central banks, with a corresponding decrease under the IRB advanced approach.

- The reduction in average exposure for corporates, institutions and retail under the standardised approach is mainly due to the deconsolidation of Industrial Bank.

- Refer to Table 7 Key points and Movements in RWAs in 2013 commentary on Page 17 for additional information.

Table 12: Credit risk exposure - by geographical region

	Exposure value							
	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total	RWAs
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013								
IRB advanced approach	513.5	342.2	263.0	26.0	297.8	26.3	1,468.8	521.2
Retail:								
- secured on real estate property .	154.8	52.1	34.4	-	69.4	-	310.7	105.4
- qualifying revolving retail	36.9	25.3	-	-	4.7	-	66.9	15.4
- SMEs1	17.2	0.8	-	-	0.6	-	18.6	8.9
- other retail	37.8	5.8	-	-	3.2	-	46.8	11.0
Total retail:	246.7	84.0	34.4	-	77.9	-	443.0	140.7
Central governments and central banks	39.7	90.4	76.4	20.5	91.7	23.0	341.7	53.0
Institutions	23.7	48.6	38.3	5.3	10.8	3.3	130.0	28.0
Corporates	163.3	118.9	113.7	0.2	112.6	-	508.7	279.7
Equity	-	-	-	-	-	-	-	-
Securitisation positions2	40.1	0.3	0.2	-	4.8	-	45.4	19.8
IRB foundation approach	16.7	-	-	6.9	-	-	23.6	13.6
Corporates	16.7	-	-	6.9	-	-	23.6	13.6

Standardised approach	236.1	54.5	236.5	50.5	26.0	64.1	667.7	329.5
Central governments and central banks	170.6	5.3	37.9	5.6	0.6	-	220.0	0.7
Institutions	3.6	0.1	30.3	1.2	-	-	35.2	12.1
Corporates	25.0	8.0	118.5	32.0	3.2	35.1	221.8	202.1
Retail	7.9	1.8	15.1	5.4	2.2	15.3	47.7	36.1
Secured on real estate property ...	7.5	2.0	24.0	3.5	8.5	4.9	50.4	28.4
Past due items	0.7	0.1	0.3	0.8	0.5	1.7	4.1	5.4
Regional governments or local authorities	-	-	-	0.1	-	0.7	0.8	0.8
Equity	0.8	0.1	-	0.2	1.7	0.5	3.3	3.5
Other items3	20.0	37.1	10.4	1.7	9.3	5.9	84.4	40.4
	766.3	396.7	499.5	83.4	323.8	90.4	2,160.1	864.3
At 31 December 2012								
IRB advanced approach	495.0	323.6	263.5	26.1	331.4	30.4	1,470.0	513.6
Retail:								
- secured on real estate property .	148.6	50.6	35.2	-	83.0	-	317.4	130.8
- qualifying revolving retail	34.4	23.6	-	-	6.0	-	64.0	16.2
- SMEs1	11.6	0.8	-	-	0.7	-	13.1	6.8
- other retail	39.0	11.1	2.9	-	7.1	-	60.1	17.2
Total retail:	233.6	86.1	38.1	-	96.8	-	454.6	171.0
Central governments and central banks	44.5	89.6	75.5	19.6	100.6	26.0	355.8	36.8
Institutions	25.9	37.3	38.5	6.4	18.6	4.4	131.1	27.0
Corporates	146.4	110.1	111.1	0.1	111.4	-	479.1	251.6
Equity	0.3	-	-	-	-	-	0.3	0.9
				-	4.0	-	49.1	

Securitisation positions2	44.3	0.5	0.3					26.3
IRB foundation approach	13.4	-	-	6.0	-	-	19.4	10.3
Corporates	13.4	-	-	6.0	-	-	19.4	10.3
Standardised approach	223.8	42.7	274.0	49.1	19.4	72.5	681.5	374.5
Central governments and central banks	130.1	0.4	44.0	2.7	0.1	0.1	177.4	0.9
Institutions	3.0	0.1	52.0	2.4	-	-	57.5	19.4
Corporates	50.3	3.6	127.3	32.7	2.5	38.1	254.5	237.3
Retail	7.6	1.9	16.5	5.2	2.8	18.9	52.9	40.1
Secured on real estate property ...	9.8	2.4	22.5	2.8	2.2	5.6	45.3	24.0
Past due items	0.6	0.1	0.2	1.2	0.4	1.9	4.4	6.0
Regional governments or local authorities	-	-	-	0.1	-	1.1	1.2	1.0
Equity	0.4	0.9	0.1	-	1.4	-	2.8	2.8
Other items3	22.0	33.3	11.4	2.0	10.0	6.8	85.5	43.0
	732.2	366.3	537.5	81.2	350.8	102.9	2,170.9	898.4

For footnotes, see page 33.

Key points

- Corporate exposure increases under the IRB advanced approach and corresponding reductions in corporate exposure under the standardised approach in Europe were mainly due to the movement of income producing real estate portfolios from standardised to the IRB slotting approach as required by the PRA.

- Secured on real estate exposure increases under the standardised approach in North America are due to the movement of commercial real estate exposure in the US from the IRB advanced approach to the standardised approach.

- Corporate exposure increases under the standardised approach in Hong Kong were due to the identification of exposures which did not meet the full modelling requirements and these were moved from the IRB advanced approach.

- Central government and central bank exposure growth under the standardised approach in Hong Kong was due to reclassification of indirect EEA sovereign exposures from the IRB advanced approach following updated policy guidance.

- Refer to Tables 7 and 11 Key points and Movements in RWAs commentary on Page 17 for additional information.

Table 13: Credit risk exposure - RWAs by geographical region

	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013							
RWAs							
IRB advanced approach	157.1	85.8	97.1	11.2	161.5	8.5	521.2
Retail:							
- secured on real estate property	9.4	3.8	3.3	-	88.9	-	105.4
- qualifying revolving retail	7.8	6.0	-	-	1.6	-	15.4
-. SMEs1	8.5	-	-	-	0.4	-	8.9
-. other retail	8.1	1.3	-	-	1.6	-	11.0
Total retail	33.8	11.1	3.3	-	92.5	-	140.7
Central governments and central banks	5.5	7.3	14.5	10.0	8.8	6.9	53.0
Institutions	8.5	7.6	7.6	1.2	1.5	1.6	28.0
Corporates	90.4	59.7	71.6	-	58.0	-	279.7
Equity	-	-	-	-	-	-	-
Securitisation positions2	18.9	0.1	0.1	-	0.7	-	19.8

IRB foundation approach	9.8	-	-	3.8	-	-	13.6
Corporates	9.8	-	-	3.8	-	-	13.6
Standardised approach	44.5	17.0	148.9	40.0	22.7	56.4	329.5
Central governments and central banks	-	-	0.6	-	0.1	-	0.7
Institutions	0.1	0.1	11.3	0.6	-	-	12.1
Corporates	21.0	7.3	105.4	30.9	2.9	34.6	202.1
Retail	6.3	1.3	11.4	4.0	1.7	11.4	36.1
Secured on real estate property	3.0	0.9	11.8	2.0	7.8	2.9	28.4
Past due items	0.9	0.1	0.3	1.0	0.6	2.5	5.4
Regional governments or local authorities	-	-	-	0.1	-	0.7	0.8
Equity	0.9	0.1	-	0.2	1.8	0.5	3.5
Other items3	12.3	7.2	8.1	1.2	7.8	3.8	40.4
	211.4	102.8	246.0	55.0	184.2	64.9	864.3

At 31 December 2012	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
RWAs							
IRB advanced approach	143.6	70.2	92.1	9.4	187.1	11.2	513.6
Retail:							
- secured on real estate property	11.1	3.8	3.8	-	112.1	-	130.8

- qualifying revolving retail	8.5	5.7	-	-	2.0	-	16.2
-. SMEs1	6.4	-	-	-	0.4	-	6.8
-. other retail	8.5	1.2	0.1	-	7.4	-	17.2
Total retail	34.5	10.7	3.9	-	121.9	-	171.0
Central governments and central banks	3.6	1.8	11.3	7.7	3.3	9.1	36.8
Institutions	7.6	5.9	7.1	1.7	2.6	2.1	27.0
Corporates	71.8	51.7	69.7	-	58.4	-	251.6
Equity	0.9	-	-	-	-	-	0.9
Securitisation positions2.....	25.2	0.1	0.1	-	0.9	-	26.3
IRB foundation approach	7.1	-	-	3.2	-	-	10.3
Corporates	7.1	-	-	3.2	-	-	10.3
Standardised approach	72.2	12.7	167.9	41.5	17.1	63.1	374.5
Central governments and central banks	-	-	0.7	-	0.1	0.1	0.9
Institutions	0.2	0.1	18.1	1.0	-	-	19.4
Corporates	45.9	3.2	116.4	32.1	2.2	37.5	237.3
Retail	5.9	1.4	12.4	3.9	2.3	14.2	40.1
Secured on real estate property	5.4	1.3	11.0	1.6	1.4	3.3	24.0
Past due items	0.7	0.1	0.3	1.6	0.6	2.7	6.0
Regional governments or local authorities	-	-	-	0.1	-	0.9	1.0
Equity	0.4	0.9	0.1	-	1.4	-	2.8
Other items3	13.7	5.7	8.9	1.2	9.1	4.4	43.0
	222.9	82.9	260.0	54.1	204.2	74.3	898.4

For footnotes, see page 33.

Key point

- Refer to tables 7, 11 and 12 Key points and Movements in RWA commentary on Page 17 for additional information.

Table 14: Credit risk exposure - RWA density by geographical region

	Europe	Hong	Rest of	MENA	North	Latin America	Total

At 31 December 2013	%	Kong %	Asia-Pacific %	%	America %	%	%
RWA density							
IRB advanced approach	31	25	37	43	54	32	35
Retail:							
- secured on real estate property	6	7	10	-	128	-	34
- qualifying revolving retail	21	24	-	-	34	-	23
-. SMEs1	49	3	-	-	63	-	48
-. other retail	21	23	-	-	50	-	23
Total retail	14	13	10	-	119	-	32
Central governments and central banks	14	8	19	49	10	30	16
Institutions	36	16	20	23	14	48	22
Corporates	55	50	63	-	52	-	55
Equity	-	-	-	-	-	-	-
Securitisation positions2	47	26	71	-	15	-	44
IRB foundation approach	59	-	-	55	-	-	58
Corporates	59	-	-	55	-	-	58
Standardised approach	19	31	63	79	87	88	49
Central governments and central banks	0	0	2	1	10	0	0
Institutions	3	100	37	53	-	-	34
Corporates	84	91	89	96	89	99	91
Retail	79	75	75	75	78	74	76
Secured on real estate property	41	43	49	56	92	60	56

Past due items	122	127	131	124	124	141	131
Regional governments or local authorities	-	-	-	100	-	92	93
Equity	124	100	-	100	100	100	105
Other items3	61	19	78	69	85	64	48
Total	28	26	49	66	57	72	40

	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total
	%	%	%	%	%	%	%
At 31 December 2012							
RWA density							
IRB advanced approach	29	22	35	36	56	37	35
Retail:							
- secured on real estate property	7	7	11	-	135	-	41
- qualifying revolving retail	25	24	-	-	33	-	25
-. SMEs1	55	-	-	-	58	-	52
-. other retail	22	12	2	-	103	-	29
Total retail	15	13	10	-	126	-	38
Central governments and central banks	8	2	15	39	3	35	10
Institutions	29	16	18	28	14	47	21
Corporates	49	47	63	-	52	-	53
Equity	370	-	-	-	-	-	370
Securitisation positions2	57	11	48	-	22	-	54
IRB foundation approach	53	-	-	53	-	-	53
Corporates	53	-	-	53	-	-	53
Standardised approach	32	30	61	84	88	87	55
Central governments and central banks	0	0	2	0	100	100	1
Institutions	5	65	35	44	-	-	34
Corporates	91	90	91	98	88	98	93
Retail	77	75	75	75	83	75	76
Secured on real estate property	55	54	49	57	62	59	53
Past due items	126	132	135	130	129	144	136

Regional governments or local authorities	-	-	-	100	-	84	86
Equity	100	100	100	-	100	-	100
Other items3	62	17	78	62	91	63	50
Total	30	23	48	67	58	72	41

For footnotes, see page 33.

Key points

- In general, standardised RWA densities show a greater consistency across regions and exposure classes than IRB advanced, as the IRB advanced approach reflects the relative risks of the different portfolios to a greater extent.

- Central government and central bank RWA densities under the IRB advanced approach have increased across most regions due to the implementation of a floor for loss-given-default of 45% as required by the PRA. Adverse internal sovereign rating changes in Egypt and Hong Kong and favourable changes for the US also contributed to the movement in RWA density.

- RWA densities for retail secured on real estate property are higher in North America than other regions due to the challenging conditions in the US mortgage market in recent years. RWA densities are lower in the UK and Hong Kong because of the resilience of the residential property sector in those markets which warrants the application of lower loss metrics for those exposures.

- Reductions in RWA density for retail secured on real estate property for the Group were due to high quality exposure growth in the UK and Hong Kong markets continued run-off, the sale of loans, and assets moving into default in the US CML portfolio in North America; and the sale of the HFC Bank UK secured loan portfolio in Europe. The latter portfolios carry higher RWA densities.

- Sale of non-real estate exposures in the US CML portfolio has improved the RWA density for the IRB advanced other retail exposure class in North America and for the Group.

- A change in treatment for the low RWA density Lombard lending portfolio in Hong Kong and the UK from IRB advanced other retail to standardised corporate was the main driver for the increase in RWA density in the Hong Kong IRB advanced other retail exposure class.

    - Business restructuring for a portfolio of SME exposures in Europe enabled a change in treatment from Corporate to Retail SME, improving the RWA density for the Retail SME exposure class.

- Refer to tables 7 and 11-13 Key points and Movements in RWAs commentary on Page 17 for additional information.

Table 15: Credit risk exposure - by industry sector

	Exposure value							
	Personal	Manu-facturing	Inter-national trade and services	Property and other business activities	Government and public admin-istration	Other commercial	Financial	cust a
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	U
At 31 December 2013								
IRB advanced approach	426.7	118.9	113.8	151.7	107.2	73.8	476.7	1
Retail:								
- secured on real estate property	310.7	-	-	-	-	-	-	
- qualifying revolving retail	66.9	-	-	-	-	-	-	
- SMEs1	-	0.9	1.7	14.2	0.4	0.9	0.5	
- other retail	46.7	-	-	-	0.1	-	-	
Total retail	424.3	0.9	1.7	14.2	0.5	0.9	0.5	
Central governments and central banks	-	-	-	-	90.4	0.2	251.1	
Institutions	-	-	-	-	0.2	-	129.8	
Corporates	2.4	118.0	112.1	137.5	16.1	72.7	49.9	
Equity	-	-	-	-	-	-	-	
Securitisation positions2	-	-	-	-	-	-	45.4	
IRB foundation approach	-	8.6	5.9	1.1	0.4	4.2	3.4	
Corporates	-	8.6	5.9	1.1	0.4	4.2	3.4	
Standardised approach	89.4	58.9	50.7	44.0	81.0	46.2	238.8	
Central governments and central banks	-	-	-	-	56.9	-	163.1	
Institutions	-	-	-	-	-	-	35.2	

Corporates	3.2	57.5	47.4	35.1	21.1	44.1	13.4	
Retail	42.5	1.0	1.9	1.2	0.2	0.6	0.3	
Secured on real estate property	41.3	0.1	1.1	7.0	-	0.9	-	
Past due items	2.4	0.3	0.3	0.4	0.1	0.6	-	
Regional governments or local authorities	-	-	-	-	0.8	-	-	
Equity	-	-	-	-	-	-	3.3	
Other items3	-	-	-	0.3	1.9	-	23.5	
	516.1	186.4	170.4	196.8	188.6	124.2	718.9	2

	Exposure value							
	Personal US$bn	Manu-facturing US$bn	Inter-national trade and services US$bn	Property and other business activities US$bn	Government and public admin-istration US$bn	Other commercial US$bn	Financial US$bn	cus U
At 31 December 2012								
IRB advanced approach	443.6	115.0	103.6	126.9	98.5	70.0	512.4	
Retail:								
- secured on real estate property	317.4	-	-	-	-	-	-	
- qualifying revolving retail	64.0	-	-	-	-	-	-	
- SMEs1	-	0.8	2.4	6.8	0.7	1.6	0.8	
- other retail	60.1	-	-	-	-	-	-	

Total retail	441.5	0.8	2.4	6.8	0.7	1.6	0.8
Central governments and central banks	-	-	-	-	77.3	0.2	278.3
Institutions	-	0.1	-	-	1.0	-	130.0
Corporates	2.1	114.1	101.2	120.1	19.5	68.2	53.9
Equity	-	-	-	-	-	-	0.3
Securitisation positions2	-	-	-	-	-	-	49.1
IRB foundation approach	-	6.4	4.2	1.9	0.6	3.4	2.9
Corporates	-	6.4	4.2	1.9	0.6	3.4	2.9
Standardised approach	90.3	60.3	56.3	58.9	75.5	51.3	208.0
Central governments and central banks	-	-	-	-	46.6	-	130.8
Institutions	-	-	-	-	-	-	57.5
Corporates	2.8	59.0	53.2	52.0	24.7	48.5	14.3
Retail	45.6	1.1	2.5	1.4	1.2	0.8	0.3
Secured on real estate property	39.1	-	-	4.8	-	1.3	0.1
Past due items	2.8	0.2	0.5	0.3	0.1	0.4	0.1
Regional governments or local authorities	-	-	-	-	1.0	-	0.2
Equity	-	-	-	0.2	-	0.2	2.4
Other items3	-	-	0.1	0.2	1.9	0.1	2.3
	533.9	181.7	164.1	187.7	174.6	124.7	723.3

For footnotes see page 33.

Table 16: Credit risk exposure - by residual maturity

	Exposure value					
	Less than 1 year	Between 1 and 5 years	More than 5 years	Undated	Total	RWAs
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013						
IRB advanced approach	642.5	405.0	421.3	-	1,468.8	521.2
Retail:						
- secured on real estate property	2.8	5.0	302.9	-	310.7	105.4
- qualifying revolving retail	66.9	-	-	-	66.9	15.4
- SMEs1	3.8	8.7	6.1	-	18.6	8.9
- other retail	7.0	23.1	16.7	-	46.8	11.0
Total retail	80.5	36.8	325.7	-	443.0	140.7
Central governments and central banks	206.4	106.1	29.2	-	341.7	53.0
Institutions	99.1	29.9	1.0	-	130.0	28.0
Corporates	223.1	230.6	55.0	-	508.7	279.7
Equity	-	-	-	-	-	-
Securitisation positions2	33.4	1.6	10.4	-	45.4	19.8
IRB foundation approach	10.6	11.5	1.5	-	23.6	13.6
Corporates	10.6	11.5	1.5	-	23.6	13.6
Standardised approach	248.0	233.5	101.2	85.0	667.7	329.5
Central governments and central banks	154.9	50.4	14.7	-	220.0	0.7
Institutions	17.9	4.3	13.0	-	35.2	12.1
Corporates	53.7	146.7	21.2	0.2	221.8	202.1
Retail	15.7	19.6	12.4	-	47.7	36.1
Secured on real estate property	2.7	9.2	38.5	-	50.4	28.4

Past due items	2.4	1.0	0.7	-	4.1	5.4
Regional governments or local authorities	0.3	0.1	0.4	-	0.8	0.8
Equity	-	-	-	3.3	3.3	3.5
Other items3	0.4	2.2	0.3	81.5	84.4	40.4
	901.1	650.0	524.0	85.0	2,160.1	864.3
At 31 December 2012						
IRB advanced approach	647.2	385.3	437.1	0.4	1,470.0	513.6
Retail:						
- secured on real estate property	3.1	6.1	308.2	-	317.4	130.8
- qualifying revolving retail	64.0	-	-	-	64.0	16.2
- SMEs1	1.4	7.3	4.4	-	13.1	6.8
- other retail	8.5	39.2	12.4	-	60.1	17.2
Total retail	77.0	52.6	325.0	-	454.6	171.0
Central governments and central banks	213.5	100.4	41.9	-	355.8	36.8
Institutions	103.6	26.5	0.9	0.1	131.1	27.0
Corporates	218.9	203.2	57.0	-	479.1	251.6
Equity	-	-	-	0.3	0.3	0.9
Securitisation positions2	34.2	2.6	12.3	-	49.1	26.3
IRB foundation approach	10.2	7.8	1.4	-	19.4	10.3
Corporates	10.2	7.8	1.4	-	19.4	10.3
Standardised approach	180.4	352.1	62.7	86.3	681.5	374.5
Central governments and central banks	88.5	83.5	5.4	-	177.4	0.9
Institutions	0.7	56.3	0.5	-	57.5	19.4
			14.5			

Corporates	64.7	175.2		0.1	254.5	237.3
Retail	19.8	28.7	4.4	-	52.9	40.1
Secured on real estate property	3.0	6.6	35.7	-	45.3	24.0
Past due items	3.0	0.8	0.6	-	4.4	6.0
Regional governments or local authorities	0.7	0.1	0.4	-	1.2	1.0
Equity	-	-	-	2.8	2.8	2.8
Other items3	-	0.9	1.2	83.4	85.5	43.0
	837.8	745.2	501.2	86.7	2,170.9	898.4

For footnotes see page 33.

Key points

- Movements for each exposure class are mainly attributable to the various drivers of exposure movements explained in the Key points for tables 7, 11 and 12, and are not reflective of any significant restructuring of customer or other third-party obligations.

Application of the IRB approach

The narrative explanations that follow relate to the IRB approaches: advanced and foundation IRB for distinct customers and advanced IRB for the portfolio-managed retail business. Details of our use of the standardised approach can be found on page 67.

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 purpose of credit approval and many other management decisions.

Use of internal estimates

PDs, LGDs, and EAD applied in the calculation of regulatory capital requirements are also extensively used for 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 wholesale 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

We have adopted the Basel II advanced approach for the majority of our business. At the end of 2013, portfolios in much of Europe, Hong Kong, Rest of Asia-Pacific and North America were on advanced IRB approaches. Others remain on the standardised or foundation approaches pending the definition of local regulations or model approval, or under exemptions or exclusion from IRB treatment. Under our Basel II IRB roll-out plans, a number of our Group companies and portfolios are in transition to advanced IRB approaches.

Under the advanced IRB approach, banks are allowed to develop their own empirical models to quantify required capital for credit risk. All such models developed by us, and any material changes to those models, must be approved by the PRA, subject to de minimis exceptions. Material changes are those that individually have a high impact, or where a number of small changes in aggregate have a high impact. The PRA sets quantitative and qualitative materiality thresholds for these model changes, and requires us to obtain their approval before implementation.

In October 2012, to increase the effectiveness of this process, the FSA introduced an annual review of IRB usage, focusing on the proportion of total credit risk assets for which IRB approaches are used.

Banks have experienced difficulties in adopting advanced IRB in some cases, for example in portfolios which have very low levels of default, such that the PD, LGD and EAD cannot be assessed to a sufficiently high degree of confidence due to a lack of default or loss data. Difficulties also arise in countries where the rules and requirements of the local regulator's implementation of Basel II are different from those of the PRA, or where the regulators have introduced capital floors and overlays to mitigate perceived model deficiencies. Tables 17 and 20 below detail several material regulatory thresholds and overlays.Whilst recognising the complexity of adopting IRB in some situations, we remain committed to working constructively with our regulators to achieve acceptable roll-out plans.

The wholesale risk rating system

This section describes how we build and operate our credit risk analytical models, and use IRB metrics, in 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 estimated using 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.

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 all relevant information, such as most recent events and market data, where available, makes the final decision on the rating. The rating assigned therefore

reflects the approver's overall view of the obligor's credit standing and propensity to default.

The finally assigned CRR determines the applicable master-scale PD range from which the reference PD, generally the arithmetical mid-point, is used in the regulatory capital calculation.

Reviewing the initial model score, relationship managers may propose a different CRR from that indicated, where they believe this more appropriate. Such amendments may only be made through an override process and must be approved by the Credit function. Overrides for each model are recorded, and override levels are reviewed, as part of the model management process.

The CRR is assigned at obligor level, which means that separate exposures to the same obligor are generally subject to a single, consistent rating. Where unfunded credit risk mitigants such as guarantees apply, these may also influence the final assignment of a CRR to an obligor. The impact of unfunded risk mitigants is considered for IRB approaches on page 66 and for the standardised approach on page 68.

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 ('Point-in-time' or 'PIT' rating system), or be free of the effects of the credit cycle ('Through-the-cycle' or '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 change in their circumstances and/or their economic operating environment.

Thus, over the economic cycle, a cycle will also appear in CRR migration. The influence of longer-term economic cycle factors implied by the model's calibration, combined with the effect of ongoing credit review, will result in long-term PDs generally above the actual default frequency during benign economic periods, but not changing so fast in a downturn. In practice, under a hybrid approach, ratings tend to be more volatile than would be the case in a pure TTC system, but less volatile than in a pure PIT one.

Moreover, our policy requires approvers to downgrade ratings on expectations, but to upgrade them only on performance. Therefore, ratings will typically migrate during a downturn in response to higher perceived risks, but be upgraded more slowly in an upswing. This leads to expected defaults overall 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 for those parameters to suit conditions in their jurisdictions. Group Risk provides co-ordination, benchmarks, and the sharing 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 taking into account such factors as available but undrawn facilities, 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, many different models and scorecards are used for PD, LGD, and EAD; there are over one hundred wholesale IRB models in use or under development within HSBC. 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, 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, typically those which 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 most material local Corporate PD models are the UK mid-market PD model, and the Hong Kong and Rest of Asia-Pacific mid-market models.

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. By contrast, 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 taking into account legal and procedural differences in the recovery and workout processes. However, 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. In 2013 the PRA required all firms to apply an LGD floor of 45% for senior unsecured exposure to sovereign entities. This floor was applied to reflect the relative paucity of loss observations across all firms in relation to these obligors. This floor is applied for the purposes of regulatory capital reporting.

In addition, the PRA has published guidance on the appropriateness of LGD models for low default portfolios generally. The PRA has determined that 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 2014, we will be required to apply LGD floors for our banks portfolio and some Asia-Pacific corporate portfolios where there are 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, we have migrated to the supervisory slotting approach for our UK commercial real estate ('CRE') portfolio during the year and have migrated our US Income Producing CRE portfolio on to the standardised approach.

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, Hong Kong and Rest of Asia-Pacific 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. The global LGD models for sovereigns and for banks reflect the expected increase in observed losses during an economic downturn period.

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 17 below sets out the key characteristics of the significant wholesale credit risk models that drive the capital calculation split by Basel 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.

Table 17: Wholesale IRB credit risk models

Basel asset classes measured	RWAs for associated asset class US$bn	Compo-nent	Number of significant models	Model description and methodology	Number of years loss data
Central governments and central banks	53.0	PD	1	A constrained expert judgement model using a combination of expert judgement and quantitative analysis. The model inputs include macro-economic and political factors.	7
		LGD	1	An unsecured model built on assessesment of structural factors that influence country's long term economic performance. Floor of 45%, applied as required by the PRA.	7
		EAD	1	Because of limited internal default experience and sparse historical data on utilisations and limits, the model was developed based on a combination of expert judgement and similar exposure types.	7
Institutions	28.0	PD	1	The model is a combination of expert judgement and statistical analysis. The model inputs include balance sheet information, country risk factors and qualitative data.	9
		LGD	1	Regression model that produces a downturn LGD and expected LGD. Inputs include collateral and country risk data.	9
		EAD	1	Regression based model that predicts Credit Conversion Factors taking into account current utilisation, available headroom, product type, and committed/uncommitted indicator.	9

Table 17: Wholesale IRB credit risk models (continued)

Basel asset classes measured	RWAs for associated	Compo-nent	Number of significant	Model description and methodology	Number of years

	asset class US$bn	models		loss data
Corporates1	269.2			
Global large corporates		PD	1Even though the portfolio is low-default, the model is statistically built and calibrated on 15 years of data. The inputs include balance sheet information, market data, macroeconomic and country risk indicators and qualitative factors.	>10
Other corporates		PD	5Corporates that fall below the Global large corporate threshold are rated through local PD models, which reflect regional circumstances. These models use balance sheet data, behavioural data and qualitative information to derive a statistically built PD.	>10
All corporates		LGD	3Local statistical models covering all corporates including Global large corporates developed using various data inputs, including collateral information, recoveries and geography.	>7
		EAD	3Local statistical models developed using various data inputs, including product type and geography.	>7

1 Excludes specialised lending exposures subject to supervisory slotting approach (RWAs: US$24.1bn).

Table 18 below sets out IRB exposures, Basel metrics, RWA density and RWAs for our most material corporate portfolios broken down by region.

Table 18: Corporate IRB portfolio analysis1

	Exposure value	Average PD2	Average LGD2	RWA density2	RWAs
	US$bn	%	%	%	US$bn
At 31 December 2013					
Europe	157.0	4.21	32.1	52	82.1
Hong Kong	113.4	1.00	39.2	50	56.3
Rest of Asia-Pacific	109.5	1.71	47.4	63	69.0
Middle East and North Africa	7.1	5.36	44.5	54	3.8

North America	112.6	1.41	37.6	52	58.0
	499.6	2.32	38.5	54	269.2

1 Excludes specialised lending exposures subject to supervisory slotting approach (EAD: US$32.7bn; RWAs: US$24.1bn).

2 Average PD, average LGD and RWA density percentages represent an exposure-weighted average.

Table 19 and the graphs below set 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 Standard and Poor's ('S&P') are cited for illustration purposes, though we also benchmark against other agencies' ratings in an equivalent manner.

For further details of the Group's approach to credit quality classification, please see the definition of 'obligor grade' in the glossary, and also page 267 of the Annual Report and Accounts 2013.

Table 19: Wholesale IRB exposure - by obligor grade1

(a) Central governments and central banks

	CRR	PD range	Exposure value2	Average PD3	Average LGD3	RWA density3	RWAs	Mapped external rating
		%	US$bn	%	%	%	US$bn	
At 31 December 2013								
Default risk								
Minimal	0.1	0.000 to 0.010	132.4	0.01	45.1	7	9.3	AAA to AA+
	1.1	0.011 to 0.028	74.3	0.02	45.0	6	4.8	AA to AA-
	1.2	0.029 to 0.053	38.7	0.04	45.0	14	5.6	A+
Low	2.1	0.054 to 0.095	64.1	0.07	45.0	18	11.7	A
	2.2	0.096 to 0.169	11.4	0.13	45.0	29	3.3	A-

Satisfactory	3.1	0.170 to 0.285	5.3	0.22	45.0	42	2.2	BBB+
	3.2	0.286 to 0.483	3.7	0.37	45.0	49	1.8	BBB to BBB-
	3.3	0.484 to 0.740	2.4	0.63	45.0	67	1.6	BBB-
Fair	4.1	0.741 to 1.022	1.1	0.87	45.0	82	0.9	BB+
	4.2	1.023 to 1.407	0.2	1.20	45.0	100	0.2	BB
	4.3	1.408 to 1.927	0.3	1.65	45.2	-	-	BB-
Moderate	5.1	1.928 to 2.620	0.9	2.25	45.0	111	1.0	BB-
	5.2	2.621 to 3.579	1.4	3.05	45.0	121	1.7	B+
	5.3	3.580 to 4.914	1.1	4.20	45.0	136	1.5	B+
Significant	6.1	4.915 to 6.718	0.3	5.75	45.4	167	0.5	B
	6.2	6.719 to 8.860	3.7	7.85	45.0	168	6.2	B-
High	7.1	8.861 to 11.402	0.4	10.00	45.0	175	0.7	B-
	7.2	11.403 to 15.000	-	-	-	-	-	CCC+
Special management	8.1	15.001 to 22.000	-	-	-	-	-	CCC
	8.2	22.001 to 50.000	-	-	-	-	-	CCC-
	8.3	50.001 to 99.999	-	-	-	-	-	CC to C
Default4	9/10	100.000	-	-	-	-	-	Default
			341.7	0.17	45.0	16	53.0	
At 31 December 2012								
Default risk								
Minimal	0.1	0.000 to 0.010	110.7	0.01	11.0	1	1.2	AAA to AA+

	1.1	0.011 to 0.028	116.6	0.02	13.2	3	3.6	AA to AA-
	1.2	0.029 to 0.053	34.5	0.04	22.6	7	2.3	A+
Low	2.1	0.054 to 0.095	60.6	0.07	33.4	15	9.0	A
	2.2	0.096 to 0.169	9.0	0.13	37.5	28	2.5	A-
Satisfactory	3.1	0.170 to 0.285	6.9	0.22	44.3	38	2.6	BBB+
	3.2	0.286 to 0.483	3.3	0.37	41.8	56	1.9	BBB to BBB-
	3.3	0.484 to 0.740	4.9	0.63	45.0	64	3.1	BBB-
Fair	4.1	0.741 to 1.022	0.8	0.87	35.0	66	0.5	BB+
	4.2	1.023 to 1.407	0.3	1.20	37.8	98	0.3	BB
	4.3	1.408 to 1.927	0.7	1.65	45.0	62	0.4	BB-
Moderate	5.1	1.928 to 2.620	1.5	2.25	45.0	110	1.6	BB-
	5.2	2.621 to 3.579	3.9	3.05	45.0	124	4.9	B+
	5.3	3.580 to 4.914	1.6	4.20	45.1	134	2.2	B+
Significant	6.1	4.915 to 6.718	0.4	5.75	35.2	118	0.5	B
	6.2	6.719 to 8.860	0.1	7.85	45.0	168	0.2	B-
High	7.1	8.861 to 11.402	-	-	-	-	-	B-
	7.2	11.403 to 15.000	-	-	-	-	-	CCC+
Special management	8.1	15.001 to 22.000	-	-	-	-	-	CCC
	8.2	22.001 to 50.000	-	-	-	-	-	CCC-
	8.3	50.001 to 99.999	-	-	-	-	-	CC to C
Default4	9/10	100.000	-	-	-	-	-	Default

		355.8	0.13	19.6	10	36.8	

For footnotes, see page 48.

Table 19: Wholesale IRB exposure - by obligor grade1 (continued)

(b) Institutions

	CRR	PD range	Exposure value2	Average PD3	Average LGD3	RWA density3	RWAs	Mapped external rating
		%	US$bn	%	%	%	US$bn	
At 31 December 2013								
Default risk								
Minimal	0.1	0.000 to 0.010	4.2	0.03	27.5	7	0.3	AAA to AA+
	1.1	0.011 to 0.028	13.9	0.03	28.1	6	0.9	AA to AA-
	1.2	0.029 to 0.053	15.4	0.04	28.5	8	1.2	A+
Low	2.1	0.054 to 0.095	48.1	0.07	34.2	12	5.7	A
	2.2	0.096 to 0.169	17.9	0.13	34.5	20	3.6	A-
Satisfactory	3.1	0.170 to 0.285	10.7	0.22	35.6	28	3.0	BBB+
	3.2	0.286 to 0.483	8.6	0.37	36.3	37	3.2	BBB to BBB-
	3.3	0.484 to 0.740	3.9	0.63	37.3	54	2.1	BBB-
Fair	4.1	0.741 to 1.022	2.0	0.87	38.4	60	1.2	BB+
	4.2	1.023 to 1.407	1.4	1.20	35.8	71	1.0	BB
	4.3	1.408 to 1.927	0.7	1.65	44.1	100	0.7	BB-
Moderate	5.1	1.928 to 2.620	0.4	2.25	45.4	100	0.4	BB-
	5.2	2.621 to 3.579	0.7	3.05	34.5	100	0.7	B+

	5.3	3.580 to 4.914	0.3	4.20	59.7	167	0.5	B+
Significant	6.1	4.915 to 6.718	0.3	5.75	69.7	200	0.6	B
	6.2	6.719 to 8.860	0.2	7.85	72.7	250	0.5	B-
High	7.1	8.861 to 11.402	0.9	10.00	49.7	211	1.9	B-
	7.2	11.403 to 15.000	0.2	13.00	52.5	200	0.4	CCC+
Special management	8.1	15.001 to 22.000	-	-	-	-	-	CCC
	8.2	22.001 to 50.000	-	-	-	-	-	CCC-
	8.3	50.001 to 99.999	-	-	-	-	-	CC to C
Default4	9/10	100.000	0.2	100.00	47.0	50	0.1	Default
			130.0	0.46	33.6	22	28.0	

At 31 December 2012
Default risk

Minimal	0.1	0.000 to 0.010	5.5	0.03	17.3	5	0.3	AAA to AA+
	1.1	0.011 to 0.028	12.2	0.03	27.0	6	0.7	AA to AA-
	1.2	0.029 to 0.053	17.0	0.04	25.7	8	1.3	A+
Low	2.1	0.054 to 0.095	45.0	0.07	34.2	12	5.4	A
	2.2	0.096 to 0.169	26.3	0.13	33.1	19	5.1	A-
Satisfactory	3.1	0.170 to 0.285	8.3	0.22	35.0	28	2.3	BBB+
	3.2	0.286 to 0.483	6.6	0.37	35.2	37	2.4	BBB to BBB-
	3.3	0.484 to 0.740	2.2	0.63	34.5	53	1.2	BBB-
Fair	4.1		2.5	0.87				

		0.741 to 1.022			36.3	62	1.6	BB+
	4.2	1.023 to 1.407	2.0	1.20	37.5	72	1.4	BB
	4.3	1.408 to 1.927	0.5	1.65	43.0	93	0.5	BB-
Moderate	5.1	1.928 to 2.620	0.2	2.25	45.0	105	0.2	BB-
	5.2	2.621 to 3.579	0.7	3.05	49.8	131	0.9	B+
	5.3	3.580 to 4.914	0.4	4.20	55.2	156	0.6	B+
Significant	6.1	4.915 to 6.718	0.5	5.75	67.8	221	1.1	B
	6.2	6.719 to 8.860	0.2	7.85	56.7	216	0.5	B-
High	7.1	8.861 to 11.402	0.5	10.00	38.2	156	0.8	B-
	7.2	11.403 to 15.000	0.3	13.00	48.8	211	0.6	CCC+
Special management	8.1	15.001 to 22.000	-	-	-	-	-	CCC
	8.2	22.001 to 50.000	-	-	-	-	-	CCC-
	8.3	50.001 to 99.999	0.1	75.00	50.7	134	0.1	CC to C
Default4	9/10	100.000	0.1	100.00	60.8	-	-	Default
			131.1	0.39	32.1	21	27.0	

For footnotes, see page 48.

Table 19: Wholesale IRB exposure - by obligor grade1 (continued)

		(c) Corporates5					
CRR	PD range	Exposure value2	Average	Average	RWA	RWAs	Mapped

				PD3	LGD3	density3		external rating
		%	US$bn	%	%	%	US$bn	
At 31 December 2013								
Default risk								
Minimal	0.16	0.000 to 0.010	-		-	-	- -	
	1.1	0.011 to 0.028	12.5	0.03	42.7	15	1.9	AAA to AA-
	1.2	0.029 to 0.053	30.1	0.04	37.5	14	4.2	A+
Low	2.1	0.054 to 0.095	55.7	0.07	39.0	21	11.7	A
	2.2	0.096 to 0.169	64.5	0.13	41.5	31	20.3	A-
Satisfactory	3.1	0.170 to 0.285	71.3	0.22	39.9	40	28.7	BBB+
	3.2	0.286 to 0.483	64.2	0.37	38.8	52	33.1	BBB to BBB-
	3.3	0.484 to 0.740	49.1	0.63	37.9	64	31.6	BBB-
Fair	4.1	0.741 to 1.022	32.8	0.87	36.9	73	23.8	BB+
	4.2	1.023 to 1.407	28.1	1.20	37.1	81	22.8	BB
	4.3	1.408 to 1.927	29.3	1.65	36.3	89	26.0	BB-
Moderate	5.1	1.928 to 2.620	20.2	2.25	33.9	93	18.8	BB-
	5.2	2.621 to 3.579	12.9	3.05	38.5	112	14.6	B+
	5.3	3.580 to 4.914	9.8	4.20	35.5	115	11.3	B+
Significant	6.1	4.915 to 6.718	4.4	5.75	33.7	125	5.5	B
	6.2	6.719 to 8.860	3.1	7.85	38.0	158	4.9	B-
High	7.1	8.861 to 11.402	2.1	10.00	32.6	148	3.1	B-
	7.2	11.403 to 15.000	0.7	13.00	28.9	171	1.2	CCC+
	8.1		1.0					

Special management		15.001 to 22.000		19.00	35.5	190	1.9	CCC
	8.2	22.001 to 50.000	0.4	36.00	26.8	150	0.6	CCC-
	8.3	50.001 to 99.999	0.3	75.00	34.5	100	0.3	CC toC
Default4	9/10	100.000	7.1	100.00	36.2	41	2.9	Default
			499.6	2.32	38.5	54	269.2	

At 31 December 2012

Default risk								
Minimal	0.16	0.000 to 0.010	-	-	-	-	-	
	1.1	0.011 to 0.028	11.9	0.03	38.3	14	1.6	AAA to AA-
	1.2	0.029 to 0.053	30.9	0.04	40.7	14	4.5	A+
Low	2.1	0.054 to 0.095	55.2	0.07	40.6	20	11.1	A
	2.2	0.096 to 0.169	65.5	0.13	41.7	31	20.2	A-
Satisfactory	3.1	0.170 to 0.285	62.9	0.22	37.5	39	24.5	BBB+
	3.2	0.286 to 0.483	55.4	0.37	37.8	49	27.2	BBB to BBB-
	3.3	0.484 to 0.740	47.1	0.63	35.2	61	28.5	BBB-
Fair	4.1	0.741 to 1.022	36.5	0.87	36.9	71	25.9	BB+
	4.2	1.023 to 1.407	27.7	1.20	35.7	78	21.5	BB
	4.3	1.408 to 1.927	26.3	1.65	36.0	85	22.4	BB-
Moderate	5.1	1.928 to 2.620	23.3	2.25	32.6	89	20.8	BB-
	5.2	2.621 to 3.579	13.1	3.05	36.7	107	14.1	B+
	5.3	3.580 to 4.914	8.1	4.20	34.0	112	9.1	B+

Significant	6.1	4.915 to 6.718	4.2	5.75	30.9	113	4.8	B
	6.2	6.719 to 8.860	2.5	7.85	36.7	151	3.8	B-
High	7.1	8.861 to 11.402	3.3	10.00	32.9	150	5.0	B-
	7.2	11.403 to 15.000	0.8	13.00	32.4	161	1.3	CCC+
Special management	8.1	15.001 to 22.000	1.0	19.00	36.6	196	1.9	CCC
	8.2	22.001 to 50.000	0.4	36.00	33.1	187	0.8	CCC-
	8.3	50.001 to 99.999	0.3	75.00	32.2	102	0.4	CC to C
Default4	9/10	100.000	6.0	100.00	38.2	35	2.0	Default
			482.4	2.19	37.8	52	251.4	

For footnotes, see page 48.

1 See glossary for definition of obligor grade.

2 Central governments and central banks exposure value includes US$1.8bn (2012: US$1.5bn) in undrawn commitments, institutions exposure value includes US$12.7bn (2012: US$14.3bn) and corporates exposure value includes US$313.1bn (2012: US$277.6bn).

3 Average PD, average LGD and RWA density percentages represent an exposure weighted average.

4 There is a requirement to hold additional capital for unexpected losses on defaulted exposures where LGD exceeds best estimate of EL. As a result, in some cases, RWAs arise for exposures in default.

5 Excludes specialised lending exposures subject to the supervisory slotting approach (EAD: US$32.7bn; RWA: US$24.1bn).

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

Key points

Central governments and central banks

- Central government and central bank average LGD, RWA density and RWA movements reflect the implementation of a floor on the loss-given-default metric of 45% as required by the PRA.

- Movements in the CRR 0.1 and CRR 1.1 bands reflect favourable migration for the US sovereign internal rating; and adverse internal rating migration for the Hong Kong sovereign.

- Movements in the CRR 5.2 and CRR 6.2 bands are due to the adverse change in the sovereign internal rating for Egypt.

Institutions

- Institutions exposures and risk distribution has remained stable overall for the Group during the period, as growth in Hong Kong from higher volumes of inter-bank and money-market lending was offset by reductions in North America and other regions. The average loss given default rate was marginally higher, reflecting the changes in product and geographical distribution.

Corporates

- Term lending, revolving credit and trade finance business growth in Rest of Asia-Pacific, Hong Kong and North America have increased exposure in the Satisfactory and Fair bands with an adverse impact on the average PD of the portfolio.

- Reductions in the Moderate and High bands were partly due to a reduction in exposures to customers with weaker credit standing in North America.

- Adverse credit migration in Hong Kong and Rest of Asia-Pacific has also contributed to the reduction in exposures in the Low band and increases in Satisfactory and Fair bands.

- Adverse movements in average LGD were partly a result of an overlay applied in Europe in response to increased observed loss rates and in advance of model recalibration contributing to higher RWAs and RWA density in the Satisfactory default band.

- Changes in approach from Standardised to IRB (e.g. UK IPRE portfolio) or vice-versa (e.g. US CRE portfolio) or corporate IRB to retail IRB, have also contributed to movements in exposure, average risk metrics and RWAs.

Wholesale exposures by CRR Band

Wholesale 2013

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

Wholesale 2012

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

Central governments and central banks

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

Institutions

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

Corporates

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

Retail risk rating systems

Owing to the different country-level portfolio performance characteristics and loss history, there are no global models for our retail portfolios. Our retail models are developed at a local level, based on portfolio behaviour and observed defaults. In the Group overall, we maintain over 800 retail behavioural or risk predictive scorecards and models. Of these, just under 300 are used with the PRA's approval under our IRB permission, the remainder being application or behavioural scorecards.

We classify approximately 30% by number of the retail IRB model population as constituting globally or regionally material risk rating systems, based on the criteria set out on page 32 and taking account of strategic importance to the Group. These material risk rating systems represented approximately 84% of our total retail IRB RWAs of US$144bn as presented in the last overall model validation review conducted in September 2013.

The ten most material risk rating systems by the above criteria, for which we disclose details of modelling methodology at table 20 below and performance data at table 26, represented RWAs of approximately US$104bn or 72% of those total retail IRB RWAs, the greater part being attributable to the five risk rating systems for residential mortgages, our most material retail exposure class.

All newly adopted IRB models for retail portfolios, irrespective of size, require PRA approval. For changes to existing IRB models, a PRA approval process applies to all but a list of de minimis exemptions representing an immaterial percentage of total Group credit risk RWAs. This approval process sets various quantitative and qualitative thresholds to ensure that all significant model changes go forward for approval.

When developing retail models, segmentation based on risk characteristics is often adopted to enhance the models' discrimination and accuracy. The majority of our retail models are designed for a particular product or group of products in a specific country. We have developed and issued global internal model governance, development, validation and monitoring standards to ensure that locally developed models adhere, as far as possible, to consistent global standards. These permit specific variances in model approach, depending on local regulatory, legal or data requirements, which are used to determine and predict the risks in these portfolios.

Our models incorporate conservatism where required under regulatory rules. Additional levels of conservatism, varying from region to region, may arise from a methodological choice of ours or from a specific regulatory intervention, depending on the local assessment of the risk factors by us and the regulatory authorities. Regulators may additionally impose 'floor' values for various metrics where data is scarce.

Our 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 a PIT approach is predominantly used, as in the UK, this becomes effectively TTC through the application of a regulatory uplift or buffer.

Our retail 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

- EAD for products with the facility for additional drawdowns is estimated as the outstanding balance of accounts at the time of observation plus a CCF applied to the undrawn portion of the facility.

Our approach to LGD estimates has more variation, particularly in respect of the downturn period calculation that they generally include. For instance, UK mortgage models use a regulatory-defined downturn based on a minimum 40% decline in house prices from peak to trough.

In Hong Kong, the downturn LGD for the mortgage model is defined to be the period in 2003-2004 when Hong Kong experienced the Severe Acute Respiratory Syndrome and historical default rates and property price declines were at their most severe.

The most material US mortgage models derive LGD based on defaults that occurred in the period 2003-2008, which includes the relatively benign years prior to 2007. Pending PRA approval to use the new set of models we have developed, referred to as the Generation 2 ('Gen2') models, we continued in 2013 to recalibrate and include agreed model adjustments and overlays to the existing Generation 1 ('Gen1') model outputs.

Table 20: Material Retail IRB risk rating systems

Portfolio	Basel asset class	RWA US$bn[1]	Component model	Number of material component models	Model description and methodology	Number of years loss data[2]	Applicable Pillar 1 regulatory thresholds and overlays
			PD	1	Statistical model built on internal behavioural data and bureau information, and calibrated to a long-run default rate.	7-10	PD floor of 0.03%
UK HSBC residential mortgages	Secured on residential mortgages	6.9	LGD	1	Statistical estimates of loss and probability of possession in combination with the workout process and using the 1990's recession in benchmarking	> 10	LGD floor of 10% at portfolio level

					the downturn LGD.		
			EAD	1	Statistical model based on historical data and uses balance at observation and expected number of months to default.	7-10	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.	7-10	PD floor of 0.03%
			LGD	1	Statistical model based on forecasting the amount of expected future recoveries.	7-10	
UK HSBC credit cards	Retail QRRE	2.6	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.	7-10	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.	7-10	PD floor of 0.03%
UK HSBC personal loans	Other retail	2.9	LGD	1		7-10	

					Statistical model based on forecasting the amount of expected future recoveries.		
			EAD	1	Rule-based calculation based on current balance which continues to be a conservative estimate for EAD.	7-10	EAD must at least be equal to current balance
UK business banking	Retail SME	4.7	PD	1	Statistical model built on internal behavioural data and bureau information, and calibrated to a long-run default rate.	7-10	PD floor of 0.03%
			LGD	2	Two sets of models - one for secured and another for unsecured exposures. The secured model uses the value to loan as a key component for estimation while the unsecured model estimates the amount of future recoveries and undrawn portion.	7-10	
			EAD	1	Statistical model using segmentation according to limit and	7-10	EAD must at least be equal to current balance

					utilisation and estimation of the undrawn exposure.		
			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 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
Hong Kong HSBC personal residential mortgages	Secured on residential mortgages	2.5					
			EAD	1	Rule-based calculation based on current balance which continues to be a conservative estimate for 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%
Hong Kong HSBC credit cards	Retail QRRE	2.5	LGD	1	Statistical model based on forecasting the amount of expected	> 10	

						future recoveries.		
			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

Portfolio	Basel asset class	RWA US$bn1	Component model	Number of material component models	Model description and methodology	Number of years loss data2	Applicable Pillar 1 regulatory thresholds and overlays
Hong Kong HSBC personal instalment loans	Other retail	1.1	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 forecasting the amount of expected future recoveries.	> 10	
			EAD	1	Rule-based calculation based on current balance which continues to be a conservative estimate for 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%
			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 while additional assumptions and estimations are done on incomplete workouts.	> 10	LGD floor of 10% at portfolio level
US Consumer Lending first lien3	Secured on residential mortgages	46.3	EAD	1	Rule-based calculation based on current balance which continues to be a conservative estimate for 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	> 10	PD floor of 0.03%

				default rate.		
		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 while additional assumptions and estimations are done on incomplete workouts.	> 10	LGD floor of 10% at portfolio level
		EAD	1	Rule-based calculation based on current balance which continues to be a conservative estimate for 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%
HSBC Mortgage Corporation first lien3	Secured on residential mortgages	LGD	1	Statistical model based on identifying the main risk drivers of loss and recovery and grouping them into	> 10	LGD floor of 10% at portfolio level
		11.9				

		homogeneous pools. Downturn LGD is derived based on the peak default rate observed while additional assumptions and estimations are done on incomplete workouts.		
EAD	1	Rule-based calculation based on current balance which continues to be a conservative estimate for EAD.	> 10	EAD must at least be equal to current balance

1 RWAs are based on estimates in September 2013, the date when the last general model validation monitoring review was conducted and reported to the PRA. The RWAs cannot therefore be compared with the 2013 year-end RWAs in tables 11 and 21.

2 Defined as the number of years from the data period used for model development up to the present.

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

In December 2013, the PRA approved our use of the Gen2 models for the CML portfolios, subject to certain conditions with regard to LGD floors and regular assessment of the capital difference in applying the US instead of the PRA rules. The CML Gen2 models were not implemented for 2013 year-end reporting, but will be in 2014. In the interim, the RWAs to be reported, for the US Consumer Lending first lien and US Mortgage Services first lien portfolios above, must be the higher of:

a) the output of the existing Gen1 models plus 120% of the difference between the Gen1 and Gen2 model outputs, and

b) the output of the Gen2 models with a 10% LGD scalar.

For the HSBC Mortgage Corporation first lien portfolio, the same condition applies, except that the percentage difference within a) is not 120%, but 100%.

Table 21 below sets out exposures, Basel metrics, RWA density and RWAs for our most material retail risk rating systems. Tables 22 and 23 show IRB exposures by exposure sub-class and portfolio quality bands: first at Group level

by internal PD band, then by geographic region using a composite EL measure.

In table 22, band seven has lower RWAs because, as assets approach and go into default, our capital requirements are increasingly reflected in an EL deduction from capital, rather than a direct RWA impact.

Table 21: Retail IRB exposures secured on real estate property

	Exposure value	Average PD1	Average LGD1	RWA density1	RWAs
	US$bn	%	%	%	US$bn
At 31 December 2013					
Total retail IRB: secured on real estate property .	310.7	4.02	20.1	34	105.4
Of which:					
- US first lien residential mortgages2	42.8	18.13	59.6	176	75.3
- UK HSBC residential mortgages3	104.4	1.11	16.4	7	7.3
- Hong Kong residential mortgages4	52.1	0.74	10.1	7	3.8
At 31 December 2012					
Total retail IRB: secured on real estate property ..	317.4	4.75	23.5	41	130.8
Of which:					
- US CML first lien residential mortgages2	35.1	26.99	64.7	215	75.4
- UK HSBC residential mortgages3	101.1	1.69	12.7	8	7.7
- Hong Kong residential mortgages4	50.6	0.77	10.1	8	3.8

1 The PD, LGD and RWA density percentages all represent exposure-weighted averages except for UK HSBC residential mortgages at 31 December 2012, which represent simple averages.If the average PD and LGD for UK HSBC residential mortgages had been calculated at 2013 year-end using the same simple averaging method as in 2012, their values would have been 1.57% and 12.4% respectively.

2 Comprises in 2013 the US Consumer Lending first lien, US Mortgage Services first lien and HSBC Mortgage Corporation first lien portfolios, compared with only the first two of these portfolios in 2012. In both years, the PD and LGD are presented before the model adjustments and overlays referred to on page 50.

3 UK excludes the First Direct division of HSBC Bank plc.

4 Hong Kong comprises the Hong Kong Area Management Office and Hang Seng Bank. Hong Kong average LGD includes a 10% floor at portfolio level.

Table 22: Retail IRB exposure - by internal PD band

	PD range	Exposure value	Average PD1	Average LGD1	RWA density1	RWAs
	%	US$bn	%	%	%	US$bn
At 31 December 2013						
Secured on real estate property						
Band 1	0.000 to 0.483	215.1	0.12	14.2	4	9.3
Band 2	0.484 to 1.022	42.2	0.65	23.4	29	12.2
Band 3	1.023 to 4.914	30.0	2.30	34.9	106	31.9
Band 4	4.915 to 8.860	5.1	5.91	54.3	308	15.7
Band 5	8.861 to 15.000	3.6	12.25	44.6	300	10.8
Band 6	15.001 to 50.000	4.9	24.16	50.2	445	21.8
Band 7	50.001 to 100.000	9.8	96.17	49.6	38	3.7
		310.7	4.02	20.1	34	105.4
Qualifying revolving retail exposures						
Band 1	0.000 to 0.483	47.9	0.12	90.7	6	2.9
Band 2	0.484 to 1.022	6.3	0.70	91.3	29	1.8
Band 3	1.023 to 4.914	9.5	2.18	88.7	62	5.9
Band 4	4.915 to 8.860	1.6	6.59	85.8	131	2.1
Band 5	8.861 to 15.000	0.7	10.90	84.9	157	1.1
Band 6	15.001 to 50.000	0.5	27.63	86.9	240	1.2
Band 7	50.001 to 100.000	0.4	88.27	78.4	100	0.4

		66.9	1.40	90.2	23	15.4
SMEs						
Band 1	0.000 to 0.483	2.6	0.25	38.3	19	0.5
Band 2	0.484 to 1.022	2.8	0.76	30.4	29	0.8
Band 3	1.023 to 4.914	8.1	2.64	40.5	57	4.6
Band 4	4.915 to 8.860	2.3	6.71	37.8	61	1.4
Band 5	8.861 to 15.000	0.8	11.08	46.3	88	0.7
Band 6	15.001 to 50.000	0.7	25.47	48.4	114	0.8
Band 7	50.001 to 100.000	1.3	99.27	34.9	8	0.1
		18.6	10.63	38.5	48	8.9
Other retail						
Band 1	0.000 to 0.483	24.6	0.20	17.7	9	2.1
Band 2	0.484 to 1.022	8.1	0.70	30.6	27	2.2
Band 3	1.023 to 4.914	11.4	1.98	28.6	39	4.5
Band 4	4.915 to 8.860	1.0	7.07	41.4	70	0.7
Band 5	8.861 to 15.000	0.5	11.76	55.7	100	0.5
Band 6	15.001 to 50.000	0.6	27.91	35.5	100	0.6
Band 7	50.001 to 100.000	0.6	93.52	56.1	67	0.4
		46.8	2.64	24.3	24	11.0
Total retail						
Band 1	0.000 to 0.483	290.2	0.12	27.3	5	14.8
Band 2	0.484 to 1.022	59.4	0.67	32.0	29	17.0
Band 3	1.023 to 4.914	59.0	2.26	43.1	79	46.9
Band 4	4.915 to 8.860	10.0	6.32	54.2	199	19.9
Band 5	8.861 to 15.000	5.6	11.88	50.6	234	13.1

Band 6	15.001 to 50.000	6.7	24.88	51.3	364	24.4
Band 7	50.001 to 100.000	12.1	96.13	49.2	38	4.6
		443.0	3.76	31.9	32	140.7

	PD range	Exposure value	Average PD1	Average LGD1	RWA density1	RWAs
	%	US$bn	%	%	%	US$bn
At 31 December 2012						
Secured on real estate property						
Band 1	0.000 to 0.483	211.1	0.12	15.0	5	10.3
Band 2	0.484 to 1.022	41.7	0.66	23.5	26	10.9
Band 3	1.023 to 4.914	34.6	2.32	43.4	112	38.7
Band 4	4.915 to 8.860	6.5	5.88	64.7	297	19.3
Band 5	8.861 to 15.000	5.1	12.30	54.0	314	16.0
Band 6	15.001 to 50.000	7.1	26.07	62.8	441	31.2
Band 7	50.001 to 100.000	11.3	96.07	58.5	39	4.4
		317.4	4.75	23.5	41	130.8
Qualifying revolving retail exposures						
Band 1	0.000 to 0.483	44.3	0.12	92.0	6	2.8
Band 2	0.484 to 1.022	6.3	0.70	91.7	28	1.8

Band 3	1.023 to 4.914	10.0	2.19	89.4	63	6.3
Band 4	4.915 to 8.860	1.9	6.69	87.5	135	2.5
Band 5	8.861 to 15.000	0.5	11.10	85.7	178	1.0
Band 6	15.001 to 50.000	0.5	26.81	87.6	257	1.3
Band 7	50.001 to 100.000	0.5	87.67	79.8	108	0.5
		64.0	1.62	91.2	25	16.2
SMEs						
Band 1	0.000 to 0.483	1.6	0.20	45.1	22	0.3
Band 2	0.484 to 1.022	1.6	0.82	37.4	36	0.6
Band 3	1.023 to 4.914	6.2	2.62	41.0	58	3.5
Band 4	4.915 to 8.860	1.7	6.81	37.4	62	1.1
Band 5	8.861 to 15.000	0.5	11.15	49.0	93	0.5
Band 6	15.001 to 50.000	0.5	25.39	48.1	124	0.7
Band 7	50.001 to 100.000	1.0	99.42	33.9	8	0.1
		13.1	11.53	40.7	52	6.8
Other retail						
Band 1	0.000 to 0.483	30.6	0.17	14.6	7	2.1
Band 2	0.484 to 1.022	8.7	0.70	28.6	25	2.2
Band 3	1.023 to 4.914	16.2	2.00	32.8	45	7.2
Band 4	4.915 to 8.860	1.5	6.95	58.8	97	1.4
Band 5	8.861 to 15.000	1.1	11.71	69.9	134	1.5
Band 6	15.001 to 50.000	1.0	27.70	64.7	168	1.7
Band 7	50.001 to 100.000	1.0	91.02	61.8	103	1.1
		60.1	3.12	25.3	29	17.2
Total retail						

Band 1	0.000 to 0.483	287.6	0.13	27.0	5	15.5
Band 2	0.484 to 1.022	58.3	0.67	32.0	27	15.5
Band 3	1.023 to 4.914	67.0	2.25	47.5	83	55.7
Band 4	4.915 to 8.860	11.6	6.29	63.6	211	24.3
Band 5	8.861 to 15.000	7.2	12.03	58.4	260	19.0
Band 6	15.001 to 50.000	9.1	26.25	63.5	382	34.9
Band 7	50.001 to 100.000	13.8	95.67	57.6	44	6.1
		454.6	4.29	33.8	38	171.0

1 Average PD, average LGD and RWA density percentages represent exposure-weighted averages.

Retail exposures by internal PD band

2013

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

2012

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

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Key points

Secured on real estate property

- Reduction in exposures for the Group was mainly driven by the continued run-off and sale of personal homeowner loans and defaulted mortgages in the US CML portfolio.

- The risk metrics for the US CML portfolio reflect the historically challenging conditions in the US mortgage market and any reductions in balances has a disproportionate benefit to the average PD and LGD and expected loss distribution of the Group's portfolio.

- High quality exposure growth in the UK and Hong Kong markets has been a key driver of improvements in the Group's average PD and LGD metrics and the expected loss distribution, although the effect has been accentuated by the appreciation of the GBP against the USD.

Qualifying revolving retail exposures

- Risk and exposure model realignment for qualifying revolving retail portfolios in the UK contributed to marginally improved risk metrics for the portfolio.

SMEs

- Business restructuring for a portfolio of SME exposures in Europe enabled a change in treatment from Corporate to Retail SME, improving the average risk metrics and the expected loss distribution.

Other retail

- Sale of non-real estate exposures in the US CML portfolio has improved the portfolio average risk metrics and expected loss distribution.

- Portfolio restructuring in the Global Private Banking business resulted in the Lombard lending portfolio in Hong Kong and the UK moving from IRB other retail to standardised corporate treatment.

The possible variation between jurisdictions' definitions underlying retail PD and LGD diminishes the usefulness of these measures as comparators for the purposes of global retail portfolio management. To address this, we also maintain an EL scale for retail business, combining obligor and facility/product risk factors in a composite measure of PD and LGD. This scale, summarised in the table below, enables the diverse risk profiles of retail portfolios across the Group to be assessed using a common denominator instead of their disparate PD and LGD measures.

Table 23: Retail IRB exposure - by geographical region1

	Exposure value				
	Europe	Hong Kong	Rest of Asia-Pacific	North America	Total exposure
	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013					
Secured on real estate property					
Expected loss band					
- less than 1%	152.1	51.6	33.5	40.4	277.6
- greater than or equal to 1% and less than 5%	1.2	0.5	0.6	13.2	15.5
- greater than or equal to 5% and less than 10%	0.3	-	-	3.5	3.8

- greater than or equal to 10% and less than 20%	0.1	-	-	2.6	2.7
- greater than or equal to 20% and less than 40%	-	-	-	1.7	1.7
- greater than or equal to 40% or exposures in default	1.1	-	0.3	8.0	9.4
	154.8	52.1	34.4	69.4	310.7
Qualifying revolving retail exposures					
Expected loss band					
- less than 1%	30.2	21.2	-	3.5	54.9
- greater than or equal to 1% and less than 5%	5.2	3.3	-	0.8	9.3
- greater than or equal to 5% and less than 10%	1.0	0.5	-	0.2	1.7
- greater than or equal to 10% and less than 20%	0.2	0.2	-	-	0.4
- greater than or equal to 20% and less than 40%	-	0.1	-	0.1	0.2
- greater than or equal to 40% or exposures in default	0.3	-	-	0.1	0.4
	36.9	25.3	-	4.7	66.9
SMEs					
Expected loss band					
- less than 1%	9.0	0.8	-	0.3	10.1
- greater than or equal to 1% and less than 5%	5.8	-	-	0.3	6.1
- greater than or equal to 5% and less than 10%	0.7	-	-	-	0.7
- greater than or equal to 10% and less than 20%	0.3	-	-	-	0.3
- greater than or equal to 20% and less than 40%	0.1	-	-	-	0.1
- greater than or equal to 40% or exposures in default	1.3	-	-	-	1.3
	17.2	0.8	-	0.6	18.6
Other retail					
Expected loss band					
- less than 1%	33.9	5.1	-	2.6	41.6

- greater than or equal to 1% and less than 5%	2.9	0.6	-	0.3	3.8
- greater than or equal to 5% and less than 10%	0.3	0.1	-	0.1	0.5
- greater than or equal to 10% and less than 20%	0.1	-	-	0.1	0.2
- greater than or equal to 20% and less than 40%	0.1	-	-	0.1	0.2
- greater than or equal to 40% or exposures in default	0.5	-	-	-	0.5
	37.8	5.8	-	3.2	46.8
Total retail					
Expected loss band					
- less than 1%	225.2	78.7	33.5	46.8	384.2
- greater than or equal to 1% and less than 5%	15.1	4.4	0.6	14.6	34.7
- greater than or equal to 5% and less than 10%	2.3	0.6	-	3.8	6.7
- greater than or equal to 10% and less than 20%	0.7	0.2	-	2.7	3.6
- greater than or equal to 20% and less than 40%	0.2	0.1	-	1.9	2.2
- greater than or equal to 40% or exposures in default	3.2	-	0.3	8.1	11.6
	246.7	84.0	34.4	77.9	443.0

	Exposure value				
			Rest of		
	Europe	Hong Kong	Asia-Pacific	North America	Total exposure
	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2012					
Secured on real estate property					
Expected loss band					
- less than 1%	145.0	50.6	34.6	42.6	272.8

- greater than or equal to 1% and less than 5%	1.8	-	0.3	19.5	21.6
- greater than or equal to 5% and less than 10%	0.4	-	-	3.9	4.3
- greater than or equal to 10% and less than 20%	0.5	-	-	4.4	4.9
- greater than or equal to 20% and less than 40%	0.6	-	-	2.7	3.3
- greater than or equal to 40% or exposures in default	0.3	-	0.3	9.9	10.5
	148.6	50.6	35.2	83.0	317.4
Qualifying revolving retail exposures					
Expected loss band					
- less than 1%	27.2	19.5	-	4.3	51.0
- greater than or equal to 1% and less than 5%	5.5	3.3	-	1.3	10.1
- greater than or equal to 5% and less than 10%	1.1	0.5	-	0.2	1.8
- greater than or equal to 10% and less than 20%	0.2	0.2	-	-	0.4
- greater than or equal to 20% and less than 40%	0.1	0.1	-	0.1	0.3
- greater than or equal to 40% or exposures in default	0.3	-	-	0.1	0.4
	34.4	23.6	-	6.0	64.0
SMEs					
Expected loss band					
- less than 1%	5.2	0.8	-	0.5	6.5
- greater than or equal to 1% and less than 5%	4.5	-	-	0.2	4.7
- greater than or equal to 5% and less than 10%	0.6	-	-	-	0.6
- greater than or equal to 10% and less than 20%	0.2	-	-	-	0.2
- greater than or equal to 20% and less than 40%	0.1	-	-	-	0.1
- greater than or equal to 40% or exposures in default	1.0	-	-	-	1.0
	11.6	0.8	-	0.7	13.1
Other retail					

Expected loss band					
- less than 1%	34.5	10.5	2.9	3.1	51.0
- greater than or equal to 1% and less than 5%	3.3	0.5	-	2.2	6.0
- greater than or equal to 5% and less than 10%	0.4	0.1	-	0.5	1.0
- greater than or equal to 10% and less than 20%	0.1	-	-	0.6	0.7
- greater than or equal to 20% and less than 40%	0.1	-	-	0.4	0.5
- greater than or equal to 40% or exposures in default	0.6	-	-	0.3	0.9
	39.0	11.1	2.9	7.1	60.1
Total retail					
Expected loss band					
- less than 1%	211.9	81.4	37.5	50.5	381.3
- greater than or equal to 1% and less than 5%	15.1	3.8	0.3	23.2	42.4
- greater than or equal to 5% and less than 10%	2.5	0.6	-	4.6	7.7
- greater than or equal to 10% and less than 20%	1.0	0.2	-	5.0	6.2
- greater than or equal to 20% and less than 40%	0.9	0.1	-	3.2	4.2
- greater than or equal to 40% or exposures in default	2.2	-	0.3	10.3	12.8
					454.6
	233.6	86.1	38.1	96.8	

1 The MENA and Latin America regions are not included in this table as retail exposures in these regions are calculated under the standardised approach.

Model performance

Model validation within HSBC is subject to global internal standards. All material models whose outputs are used in calculations of IRB capital requirements fall under this governance framework. These arrangements are 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.

The purpose of periodic monitoring and validation is therefore:

- to determine that the model continues to produce accurate outputs, suitable for the intended purposes;
- to confirm that the model remains conceptually sound, that the model design is still appropriate and the assumptions made at development remain valid;
- to ensure that the model is used for its intended purpose and for appropriate exposures only (use test); and
- to prompt corrective actions when the model outputs move away from the expected levels.

Models are validated against a series of metrics and triggers approved by the governance committee. The metrics and quantitative checks for periodic validation include a review of the data inputs and overall population stability, and an assessment of the model's discriminatory power or rank order capability, its calibration accuracy, and its performance against available benchmarks. The qualitative checks include and reconfirm all elements assessed at design phase, including the model's conceptual soundness.

The results of periodic in-depth validation must be presented to a model governing committee at least annually. A subset of the key performance metrics is produced and reviewed as part of the ongoing monitoring process.

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 Group overall. We therefore disclose data covering most wholesale models including corporate models on an aggregated basis, and on our individually most material retail models as set out in table 20 above. The tables below show estimated values at the beginning of the relevant observation periods, and subsequent actual experienced values, for key Basel II metrics. Values for wholesale models are shown in tables 24 and 25, and for retail models in table 26. The basis of preparation of each table is set out below and in footnotes.

Wholesale credit models

For wholesale portfolios, we disclose performance for models covering sovereign obligors, banks and corporates. As explained on page 42, we operate global models for the first two of these customer groups. In the case of corporates, we have aggregated data on models covering a customer population ranging from large multinational companies to medium-sized and smaller corporates. The PD analysis for this group includes mainly advanced IRB exposures but also a small element of foundation IRB.

In table 24 below, the data for sovereigns and banks are based on such a small number of defaults that the comparison of estimated with actual results, even where these are available, is not fully reflective of a model's performance. To mitigate this characteristic of low-default portfolios, additional analysis is carried out on these models at annual validation. This analysis shows that they discriminate risk well and are conservatively calibrated. The latter reflects both a prudent modelling approach and the conservatism required by regulations. As noted on page 43 the sovereign exposures are subject to an explicit regulatory floor applied for the calculation of regulatory capital.

The basis of preparation of this table has been further enhanced, compared with the prior year, primarily through the alignment of the data collection period across all local models and improved data collection in the Banks model. Within table 24, for back-testing purposes, a customer's CRR/PD is observed at a point in time and then their default or non-default status in the following one-year period is recorded against that PD grade. The PD presentation here is

expressed for all exposure classes on an obligor count basis, as model performance is judged on this basis in validation. The LGD and EAD refer to observations for the defaulted population, being the appropriate focus of an assessment of these models' performance.

Table 24: IRB models - estimated and actual values (wholesale)

	PD1		LGD2		EAD3	
	Estimated	Actuals	Estimated	Actuals	Estimated	Actuals
	%	%	%	%	%	%
2013						
Sovereigns model4	4.14	-	-	-	-	-
Banks model5	3.18	0.20	40.01	-	0.06	0.04
Corporates models6	2.63	1.20	33.09	18.69	0.54	0.48
2012						
Sovereigns model4	3.56	0.69	-	-	-	-
Banks model5	3.60	0.37	55.00	-	0.01	0.01
Corporates models6	2.79	1.41	40.46	37.30	2.45	2.27

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

2 Average LGD values are EAD-weighted.

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

4 No defaults have been observed in the Sovereign portfolio since 31 December 2012.

5 Banks figures are calculated based on two observed defaults. There are no resolved cases since 31 December 2011, hence actual LGD is not yet crystallised.

6 In 2012, covered the combined populations of the global large corporates model and all regional IRB models for large, medium and small corporates, extended in 2013 to include non-bank financial institutions.

Table 25 below expands upon the estimated and actual corporate PD in table 24, as sufficient defaults in this population make analysis at this level meaningful. This analysis is conducted as part of regular validation to ensure that, throughout the entire population, there is a satisfactory degree of conservative performance at all grades. Table 25 is not comparable with table 19 (c) on page 47, mainly because table 25 is a distribution of facility limits, rather than exposure value, and for a back-testing population that does not exactly match the exposure class population of table 19 (c).

Table 25: IRB models - corporate PD models - performance by CRR grade

	Corporates1				
	Facility2	Defaulted3	Estimated PD4	Actual PD5	Diff. in PD
	%	%	%	%	%
2013					
CRR 0.16	0.00	0.00	0.01	0.00	0.01
CRR 1.1	4.83	0.00	0.02	0.00	0.02
CRR 1.2	7.47	0.00	0.04	0.00	0.04
CRR 2.1	20.85	0.00	0.07	0.00	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
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 100.00

	Corporates1				
	Facility2	Defaulted3	Estimated PD4	Actual PD5	Diff. in PD
	%	%	%	%	%
2012					
CRR 0.16	0.00	0.00	0.01	0.00	0.01
CRR 1.1	7.24	0.00	0.02	0.00	0.02
CRR 1.2	9.42	0.00	0.04	0.00	0.04
CRR 2.1	9.09	0.01	0.07	0.12	(0.05)
CRR 2.2	11.51	0.01	0.13	0.02	0.11
CRR 3.1	15.81	0.00	0.22	0.06	0.16
CRR 3.2	12.46	0.06	0.37	0.19	0.18
CRR 3.3	8.96	0.25	0.63	0.31	0.32
CRR 4.1	6.45	0.25	0.87	0.29	0.58
CRR 4.2	4.13	0.78	1.20	0.86	0.34
CRR 4.3	4.08	0.30	1.65	0.64	1.01
CRR 5.1	3.75	0.68	2.25	0.90	1.35
CRR 5.2	2.43	0.84	3.05	1.05	2.00
CRR 5.3	1.81	1.31	4.20	1.61	2.59
CRR 6.1	1.10	6.37	5.75	3.75	2.00
CRR 6.2	0.73	2.62	7.85	3.48	4.37
CRR 7.1	0.43	7.06	10.00	7.41	2.59
CRR 7.2	0.17	5.91	13.00	10.42	2.58

CRR 8.1	0.24	10.02	19.00	11.90	7.10
CRR 8.2	0.13	21.36	36.00	16.70	19.30
CRR 8.3	0.06	14.68	75.00	28.57	46.43
Total	100.00				

1 In 2012, covered the combined populations of the global large corporates model and all regional IRB models for large, medium and small corporates, extended in 2013 to include 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 required under BIPRU 4.4.64.

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, but restricted to the strongest central governments, central banks and institutions.

Retail credit models

In the case of retail portfolios, we do not operate global models and disclose information on our most material local risk rating systems.

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 standards, our regions adopt back-testing criteria specific to local conditions in order to assess the accuracy of their models.

The UK estimated values are based on model outputs including misalignment buffers for PD, downturn adjustments for EAD and LGD, and regulatory floors. In conducting back-testing, the actual LGD value for our UK residential mortgages is supplemented by the latest LGD estimate to determine the percentage of loss for those defaulted accounts which are still in the workout process. UK estimates in table 26 remain conservative and higher than actual outcomes with the exception of the Business Banking PD, whose under-estimation has since been addressed, with the latest monitoring showing a 1% over-estimation.

The Hong Kong estimated PD and LGD values include additional conservatism and stressed factors to reflect downturn conditions, especially in the case of the residential mortgage model, although they do not include any regulatory floors. For back-testing purposes, the estimated LGD value for our Hong Kong residential mortgages uses a performance period of two years in order to make a more accurate assessment of actual losses. Except for the under-estimation in the HSBC credit card EAD and HSBC personal instalment loans LGD models, all Hong Kong retail model estimates have been close to, or higher than, actual outcomes. Redevelopment of the underperforming models is due to be completed within 2014.

In the US, the risk profile of our portfolios has undergone significant change in recent years, not only due to the difficult economic environment, increasing levels of loan modifications and regulatory measures including the foreclosure moratoria, but also through the Group's strategic decision to run off the CML portfolios.

Our management of these portfolios is informed by the outputs of both the Gen1 and Gen2 models.

Until the newly approved Gen2 models are deployed in our capital reporting systems, we will continue to make a quantitative adjustment to the amount of capital we hold against these portfolios to reflect the underperformance of the existing Gen1 models. The performance metrics shown in table 26 refer to the Gen1 model outputs without the quantitative adjustment.

Table 26: IRB models - estimated and actual values (retail)1,2

	PD		LGD3		EAD	
	Estimated	Actuals	Estimated	Actuals	Estimated	Actuals
	%	%	%	%	US$m	US$m
2013						
UK4						
HSBC residential mortgage	0.55	0.38	17.30	6.40	322.8	309.6
HSBC credit card	1.54	1.27	88.10	84.10	180.9	178.4
HSBC personal loans	3.57	2.35	85.40	73.00	79.4	76.2
Business Banking (Retail SME)	2.39	2.61	78.00	70.00	105.4	103.6
Hong Kong5						
HSBC personal residential mortgage	0.71	0.03	1.84	0.43	8.3	8.0
HSBC credit card	0.63	0.33	91.41	84.58	64.2	68.0
HSBC personal instalment loans	2.2	1.99	90.07	96.16	26.2	24.0
US						
Consumer Lending real estate first lien	7.74	8.22	67.13	64.93	148.6	140.5
Mortgage Services real estate first lien	10.15	9.68	60.04	62.92	65.0	62.2
HSBC Mortgage Corporation first lien	4.64	4.43	49.85	37.17	28.9	28.9
2012						
UK4						

HSBC residential mortgage	0.45	0.41	7.50	7.20	-	-
HSBC credit card	1.63	1.42	90.80	90.40	205.20	205.40
Hong Kong5						
HSBC personal residential mortgage ..	0.82	0.04	0.87	0.21	-	-
HSBC credit card	0.69	0.32	89.23	83.94	58.41	59.24
US						
Consumer Lending real estate first lien	8.77	9.99	52.03	76.10	-	-
Mortgage Services real estate first lien	14.92	10.99	56.36	63.54	-	-

1 All Retail estimated PD values are based on the total number of accounts not in default for the given observation period, while LGD and EAD values are based on the analysis of defaulted accounts only.
2 The information provided in this table is not comparable with that in table 21 due to the stated differences in basis of preparation.
3 LGD values represent the amount of loss as a percentage of EAD, based on a recovery period starting at the date of default and ending for the UK, 16 months from the date of default; for Hong Kong, 24 months; for the CML portfolios, 30 months, and for HSBC Mortgage Corporation, 36 months.
4 UK excludes the First Direct division of HSBC Bank plc.
5 Hong Kong excludes Hang Seng Bank.

EL and impairment

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.

This analysis includes comparison of the EL calculated in the use of IRB risk rating models, which drives part of the regulatory capital calculation, with other reported measures of loss within financial statements prepared under IFRSs. The excess of EL over impairment allowances is treated as a capital deduction in the composition of regulatory capital.

The disclosures below set out:

- commentary on aspects of the relationship between regulatory EL and impairments recognised in our financial statements; and
- tables of EL and impairment allowances and charges by exposure class (within Retail IRB, also by sub-class) and by region.

When comparing regulatory EL with measures of impairment 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.

Tables 27 and 28 set out, for IRB credit exposures, the EL (opening and closing balances), impairment allowances and the actual loss experience reflected in impairment charges. Impairment allowances represent management's best estimate of losses incurred in the loan portfolios at the balance sheet date. Impairment charges represent a movement in the impairment allowance balance during the year, reflecting loss events which occurred during the financial year and changes in estimates of losses arising on events which occurred prior to the current year. EL represents the one-year regulatory expected loss accumulated in the book and calculated at a point in time.

The figures for impairment allowances and charges shown below are prepared on an accounting consolidation basis, but are not significantly different from those calculated on a regulatory consolidation basis.

EL and loan impairment (IRB only)

http://www.rns-pdf.londonstockexchange.com/rns/7387A_-2014-2-23.pdf

Examples of differences in definition and scope between EL and impairment allowances

- Under IAS 39 our estimates of loss in impairment allowances are required to reflect the current circumstances and specific cashflow 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 impairment allowances 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 TTC estimates of PD over a one-year future horizon, determined via statistical analysis of historical default experience. Impairment allowances 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 impairment allowances are measured using estimated future cash flows as 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 impairment;

- LGDs typically include all costs associated with recovery, whereas the measurement of impairment considers only the costs of obtaining and selling collateral;

- The LGD and EAD used for the EL calculation in the Foundation IRB approach is set by regulations and may differ significantly from the assumptions about estimated cash flows used to calculate impairment allowances;

- For EL, certain exposures are subject to regulatory minimum thresholds for one or more parameters, whereas impairments under IFRSs are determined using management's judgement about estimated future cashflows; and

- 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.

Table 27: IRB expected loss and impairment - by exposure class1

	Expected loss at		Impairment allowances at	charge for the
	1 January	31 December	31 December	year
	US$bn	US$bn	US$bn	US$bn
2013				
IRB exposure classes				
Central governments and central banks	0.2	0.3	-	-
Institutions	0.3	0.3	0.1	-
Corporates	4.3	5.8	4.4	1.5
Retail	12.5	9.3	5.1	1.2
- secured on real estate property	9.9	7.2	3.6	0.8
- qualifying revolving retail	0.8	0.7	0.4	0.3
- SMEs	0.7	0.9	0.7	-
- other retail	1.1	0.5	0.4	0.1
	17.3	15.7	9.6	2.7

	Expected loss at		Impairment allowances at	charge for the
	1 January	31 December	31 December	year
	US$bn	US$bn	US$bn	US$bn
2012				
IRB exposure classes				

Central governments and central banks	0.2	0.2	-	-
Institutions	0.3	0.3	-	-
Corporates	4.5	4.3	3.9	1.3
Retail	14.5	12.5	7.3	3.5
- secured on real estate property	8.6	9.9	5.3	2.4
- qualifying revolving retail	3.6	0.8	0.4	0.6
- SMEs	0.8	0.7	1.0	-
- other retail	1.5	1.1	0.6	0.5
	19.5	17.3	11.2	4.8

1 Excludes securitisation exposures because EL is not calculated for this exposure class.

Table 28: IRB expected loss and impairment - by geographical region1

	Expected loss at		Impairment allowances at	charge for the year
	1 January US$bn	31 December US$bn	31 December US$bn	US$bn
2013				
Europe	4.7	6.0	4.5	1.4
Hong Kong	0.7	0.8	0.4	0.1
Rest of Asia-Pacific	1.0	1.1	0.6	0.1
Middle East and North Africa	0.3	0.4	0.2	-
North America	10.5	7.4	3.9	1.1
Latin America	0.1	-	-	-
	17.3	15.7	9.6	2.7
2012				
Europe	4.8	4.7	3.7	1.3

Hong Kong	0.8	0.7		
.....			0.4	0.1
Rest of Asia-Pacific	0.9	1.0		
.....			0.6	0.1
Middle East and North Africa	0.3	0.3		
.....			0.2	0.1
North America	12.7	10.5		
.....			6.3	3.2
Latin America	-	0.1	-	
.....				-
	19.5	17.3		
			11.2	4.8

1 Excludes securitisation exposures because EL is not calculated for this exposure class.

Key points

- In North America, EL reductions during the year were mainly due to sales of defaulted mortgages and non-real estate exposures and the continued run-off for the US CML portfolio, partially offset by movements of mortgages into
default in the US CML portfolio.

- The impairment allowances in North America reduced due to continued run-off and loan sales in the US CML portfolio, while the impairment charge reduced due to lower levels of new impaired loans and delinquency in the US CML portfolio.

- In Europe, EL increased due to the movement of the UK income producing real estate portfolio from the standardised approach to the IRB supervisory slotting approach. This was also a driver for the increase in impairment
allowances, while the impairment charge reduced.

- The excess of EL over impairment allowances for the Group has remained stable. Reductions primarily from the loan sales and run-off in the US CML portfolio where the reductions in EL were higher than the reduction in impairments has been offset by: the movement of the UK IPRE portfolio from standardised to IRB slotting; corporate exposure growth in Hong Kong and Rest of Asia-Pacific and the application of the 45% floor on loss-given default for sovereign exposures on the IRB advanced approach.

Details of the Group's impaired loans and advances, past due but not impaired assets and impairment allowances and charges are set out from page 172 of the Annual Report and Accounts 2013.
Our approach for determining impairment allowances is explained on page 434 of the Annual Report and Accounts 2013.

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 nevertheless a key aspect of effective risk management and, in a diversified financial services organisation such as HSBC, takes many forms.

Our general policy is to promote the use of credit risk mitigation, justified by commercial prudence and good practice as well as capital efficiency. Specific, detailed policies cover the acceptability, structuring and terms of various types of business 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.

We have safeguards designed to ensure that exposures to providers or types of risk mitigation do not become excessive in relation to the Group's capital resources.

Collateral

The most common method of mitigating credit risk is to take collateral. In our retail residential and 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. Guarantees from third parties can arise where the Group extends facilities without the benefit of any alternative form of security, e.g. where it issues a bid or performance bond in favour of a non-customer at the request of another bank.

Further information regarding collateral held over residential and CRE property is provided from page 179 of the Annual Report and Accounts 2013.

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 over-the-counter ('OTC') derivatives activities and in securities financing transactions ('SFT's) 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 can be found on page 70.

Other forms of collateral

Our Global Banking and Markets business utilises credit risk mitigation to manage the credit risk of its portfolios, with the goal of reducing concentrations in individual names, sectors or portfolios. The techniques in use include credit default 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. Further information on our use of CDS mitigants can be found on page 179 of the Annual Report and Accounts 2013.

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. Market trading activities such as collateralised OTC derivatives and SFTs typically carry out daily valuations in support of margining arrangements. In the residential mortgage business, Group policy prescribes re-valuation 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. Re-valuations are sought where, for example, as part of the regular credit assessment of the obligor, material concerns arise in relation to the performance of the collateral. CRE re-valuation 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. Where such concerns exist the re-valuation method selected will depend upon the loan to value relationship, the direction in which the local CRE market has moved since last valuation, and most importantly the specific characteristics of the underlying commercial real estate which is of concern.

Recognition of risk mitigation under the IRB approach

Within an IRB approach, risk mitigants are considered in two broad categories: first, those which reduce the intrinsic PD of an obligor and therefore operate as determinants of PD; and second, those which affect the estimated recoverability of obligations and require adjustment of LGD or, in certain circumstances, EAD.

The first typically include full parental guarantees - where one obligor within a group of companies guarantees another. This is usually factored into the estimate of the latter's PD, as it is assumed that the guarantor's performance materially informs the PD of the guaranteed entity. PD estimates are also subject to supplementary methodologies in respect of a 'sovereign ceiling', constraining the risk ratings assigned to obligors in countries of higher risk, and where only partial parental support exists. In addition, in certain jurisdictions, certain types of third party guarantee are recognised through substitution of the obligor's PD by the guarantor's PD.

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 taken into consideration 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 latter typically in support of subsidiaries of their company group. Across HSBC, the nature of such customers and transactions is very diverse and the creditworthiness of guarantors accordingly spans a wide spectrum. The creditworthiness of providers of unfunded credit risk mitigation is taken into consideration as part of the guarantor's risk profile when, for example, assessing the risk of other exposures such as direct lending to the guarantor. Internal limits for such contingent exposure are approved in the same way as direct exposures.

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 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 and processing, including performance of calculations to apply the relevant Basel II rules and approach. 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 (as a significant factor in grade determination) or LGD, or both;

- eligible financial collateral under the IRB advanced approach is taken into account 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 ('FCCM') were applied; and

- for all other types of collateral, including real estate, the LGD for exposures calculated under the IRB advanced approach will be 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.

The table below 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.

Further information on credit risk mitigation may be found from page 178 of the Annual Report and Accounts 2013.

Table 29: IRB exposure - credit risk mitigation

	At 31 December 2013		At 31 December 2012	
	Exposure value covered by credit derivatives or guarantees US$bn	Exposure value US$bn	Exposure value covered by credit derivatives or guarantees US$bn	Exposure value US$bn
Exposures under the IRB advanced approach				
Central governments and central banks	-	341.7	-	355.8
Institutions	2.1	130.0	1.9	131.1
Corporates	55.9	508.7	43.8	479.1
Retail	29.6	443.0	29.7	454.6

Equity	-	-	-	0.3
Securitisation positions	-	45.4	-	49.1
		1,468.8		1,470.0
Exposures under the IRB foundation approach				
Corporates1	0.1	23.6	0.2	19.4

1 The value of exposures under the IRB foundation approach covered by eligible financial and other collateral was US$0.6bn (2012: US$0.6bn).

Application of the standardised approach

The standardised approach is applied where exposures do not qualify for use of an IRB approach and/or where an exemption from IRB has been granted. The standardised approach requires banks to use risk assessments prepared by External Credit Assessment Institutions ('ECAI's) or Export Credit Agencies 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 PRA-recognised ECAIs for this purpose - Moody's Investors Service ('Moody's'), S&P and Fitch Group ('Fitch'). We have not nominated any Export Credit Agencies.

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 PRA's rating selection rules. The systems then apply the PRA's prescribed credit quality step mapping to derive from the rating the relevant risk weight.

Credit quality step	Moody's assessments	S&P's assessments	Fitch's assessments
1	Aaa to Aa3	AAA to AA-	AAA to AA-
2	A1 to A3	A+ to A-	A+ to A-

3	Baa1 to Baa3	BBB+ to BBB-	BBB+ to BBB-
4	Ba1 to Ba3	BB+ to BB-	BB+ to BB-
5	B1 to B3	B+ to B-	B+ to B-
6	Caa1 and below	CCC+ and below	CCC+ and below

All other exposure classes are assigned risk weightings as prescribed in the PRA's rulebook.

Exposures to, or guaranteed by, central governments and central banks of EEA States are risk-weighted at 0% using the Standardised approach, provided they would be eligible under that approach for a 0% risk weighting.

Associates' exposures are calculated under the standardised approach and, at 31 December 2013, represented approximately 17% (2012: 18%) of Group credit risk RWAs. The decrease is mainly due to the reclassification of Industrial Bank from an associate to a financial investment.

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 mismatch (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 FCCM 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 30 sets out the credit risk mitigation for exposures under the standardised approach, expressed as the exposure value covered by the credit risk mitigant, and table 31 sets out the distribution of standardised exposures across credit quality steps. This analysis excludes regional governments or local authorities, short-term claims, securitisation positions, collective investment undertakings and multilateral development banks, as these exposures continue to be immaterial as a percentage of total standardised exposures. Also excluded, because the credit quality step methodology does not apply, are retail, equity, past due items and exposures secured on real estate property.

Table 30: Standardised exposure - credit risk mitigation

	At 31 December 2013			At 31 December 2012		
	Exposure value covered by eligible financial and other	Exposure value covered by credit derivatives or guarantees	Total exposure value	Exposure value covered by eligible financial	Exposure value covered by credit derivatives or guarantees	Total exposure value

	collateral			and other collateral		
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
Exposures under the standardised approach						
Central governments and central banks	-	4.4	220.0	-	0.4	177.4
Institutions	-	3.4	35.2	0.3	1.5	57.5
Corporates	13.1	5.5	221.8	4.7	5.6	254.5
Retail	1.0	-	47.7	0.8	-	52.9
Secured on real estate property	-	-	50.4	-	-	45.3
Past due items	-	-	4.1	-	-	4.4
Regional governments or local authorities	-	-	0.8	-	-	1.2
Equity	-	-	3.3	-	-	2.8
Other items1	0.2	-	84.4	-	-	85.5
			667.7			681.5

1 Primarily includes such items as fixed assets, prepayments, accruals and Hong Kong Government certificates of indebtedness.

Table 31: Standardised exposure - by credit quality step

	At 31 December 2013		At 31 December 2012	
	Exposure value	RWAs	Exposure value	RWAs
	US$bn	US$bn	US$bn	US$bn
Central governments and central banks				
Credit quality step 1	218.8		176.5	
Credit quality step 5	0.1		0.2	

Credit quality step unrated	1.1		0.7	
	220.0	0.7	177.4	0.9
Institutions				
Credit quality step 1	3.5		2.9	
Credit quality step unrated	31.7		54.6	
	35.2	12.1	57.5	19.4
Corporates				
Credit quality step 1	4.1		6.2	
Credit quality step 2	2.2		2.5	
Credit quality step 3	2.8		30.0	
Credit quality step 4	0.8		7.3	
Credit quality step 5	0.7		0.8	
Credit quality step 6	0.3		0.8	
Credit quality step unrated	210.9		206.9	
	221.8	202.1	254.5	237.3

Key points

- Central government and central bank exposure growth in credit quality step 1 was due to growth in placements with the Bank of England and higher holdings of UK gilts.

- Reclassification of Industrial Bank from an associate to an investment, removing the requirement for proportional regulatory consolidation of exposure, was the primary driver of the exposure value reductions for institutions and a contributor to the movement for corporates in the credit quality step unrated band.

- Corporates exposure reductions in credit quality step 3 were due to portfolios moving from the Standardised to the IRB approach, where the largest contributor to the reduction was the UK income producing real estate portfolio.

- Corporate exposure increases for credit quality step band unrated were due to a combination of: growth in Bank of Communications; transfer of the US CRE portfolio from IRB advanced to standardised as required by the PRA; and the identification of exposures which did not meet the full modelling requirements in Hong Kong and Rest of Asia-Pacific and these were subsequently moved from the IRB advanced approach.

Counterparty credit risk

Counterparty credit risk arises for OTC derivatives and SFTs. It is calculated in both the trading and non-trading books, and is the risk that a counterparty to a transaction may default before completing the satisfactory settlement of the transaction. An economic loss occurs if the transaction or portfolio of transactions with the counterparty has a positive economic value at the time of default.

Three approaches are used under Basel II to calculate exposure values for counterparty credit risk: standardised, mark-to-market and IMM. Exposure values calculated under these approaches are used to determine RWAs. Across the Group, we use both the mark-to-market and IMM approaches. 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:

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

Limits for counterparty credit risk exposures are assigned within the overall credit process. The measure used for counterparty credit risk management is the 95th percentile of potential future exposure.

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. Risk is then assessed for each counterparty using models that consider volatility, trade maturity and the counterparty legal documentation.

The models and methodologies used in the calculation of counterparty risk are approved by the Counterparty Risk Methodology Committee, a sub-committee of Group MOC. Models are subject to independent review when they are first developed and reviewed annually thereafter.

Credit valuation adjustment

As shown in table 9, CRD IV introduced a new regulatory capital charge to cover the risk of mark-to-market losses on expected counterparty risk to derivatives: CVA risk capital charge.

Further details of our estimated CVA risk capital charge may be found on page 327 of the Annual Report and Accounts 2013.

Collateral arrangements

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

Eligible collateral types are controlled under a policy to ensure price transparency, price stability, liquidity, enforceability, independence, reusability and eligibility for regulatory purposes. A valuation 'haircut' policy reflects the fact that collateral may fall in value between the date the collateral was called and the date of liquidation or enforcement. At least 95% of collateral held as credit risk mitigation under Credit Support Annex ('CSA's) is either cash or liquid government securities.

Credit ratings downgrade

A Credit Rating Downgrade clause in a Master Agreement or a Credit Rating Downgrade Threshold clause in a CSA are designed to trigger a series of events if the credit rating of the affected party falls below a specified level. These events 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.

We control the inclusion of credit ratings downgrade language in a Master Agreement or a CSA by requiring each Group office to obtain the endorsement of the relevant credit authority together with the approval of the Regional Global Markets COO.

Relevant management information is in place to enable us to identify any additional collateral requirements, where the threshold levels for these are affected by a credit ratings downgrade clause within a collateral agreement.

At 31 December 2013, the potential value of the additional collateral (pertaining to ISDA CSA download thresholds only) that we would need to post with counterparties in the event of a one notch downgrade of our rating was US$0.5bn (2012: US$0.7bn) and for a two notch downgrade US$0.9bn (2012: US$1.0bn).

Table 32: Counterparty credit risk exposure - credit derivative transactions1

	At 31 December 2013			At 31 December 2012		
	Protection bought US$bn	Protection sold US$bn	Total US$bn	Protection bought US$bn	Protection sold US$bn	Total US$bn
Credit derivative products used for own credit portfolio						
Credit default swaps	2.7	-	2.7	1.6	-	1.6
Total notional value	2.7	-	2.7	1.6	-	1.6
Credit derivative products used for intermediation2						

Credit default swaps	328.3	322.5	650.8	428.0	421.7	849.7
Total return swaps	8.5	16.3	24.8	16.8	33.4	50.2
Credit spread options	-	-	-	-	-	-
Other	-	-	-	-	-	-
Total notional value	336.8	338.8	675.6	444.8	455.1	899.9
Total credit derivative notional value	339.5	338.8	678.3	446.4	455.1	901.5

1 This table provides a further breakdown of totals reported on page 501 of the Annual Report and Accounts 2013 on an accounting consolidation basis.
2 This is where we act as intermediary for our clients, enabling them to take a position in the underlying securities but without having to take on the risks ourselves.

Table 33: Counterparty credit risk - net derivative credit exposure1

	At 31 December	
	2013	2012
	US$bn	US$bn
Counterparty credit risk2		
Gross total fair values	569.6	729.7
Accounting offset arrangements	(287.3)	(372.2)
Total gross derivatives	282.3	357.5
Less: netting benefits3	(209.0)	(270.2)
Netted current credit exposure	73.3	87.3
Less: collateral held	(43.3)	(40.7)
Net derivative credit exposure	30.0	46.6

1 This table provides a further breakdown of totals reported on page 499 in the Annual Report and Accounts 2013 on an accounting consolidation basis.

2 Excludes add-on for potential future credit exposure.

3 This is the netting benefit available for regulatory capital purposes which is not recognised under accounting rules.

Under IFRSs, 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 PRA 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 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.

Table 34 shows how the total OTC derivative regulatory exposures in table 35 are derived from the gross total fair values reported in table 33.

Table 34: Comparison of derivative accounting balances and counterparty credit risk exposure

	At 31 December 2013	
	Accounting balances US$bn	Regulatory exposures US$bn
Gross total fair values		
OTC derivatives	556.0	556.0
Exchange traded derivatives1	13.6	-
	569.6	556.0
Central counterparties2	-	(283.6)
Accounting offset arrangements		
IFRS basis	(287.3)	-
Mark to market method		
Potential future credit exposure	-	95.1
Legal right of offset3	-	(157.0)
IMM method		
Modelling impact4	-	(104.7)
	-	
Total derivative exposures	282.3	105.8

1 Exchange traded derivatives attract a zero risk-weight under Basel 2 rules

2 Under Basel 2 rules OTC derivative trades transacted with central counterparties are excluded from the counterparty credit risk calculation
3 Legal right of offset derivative netting is a component of the US$252.3bn derivatives offset in the 'Maximum Exposure to Credit Risk' table on page 159 of the Annual Report and Accounts 2013.
4 The modelling impact for IMM exposures represents the difference between fair value and the Exposure at Default (calculated as 1.4 times the Effective Expected Potential Exposure) resulting from the model; the model incorporates offsets for netting benefits, correlation impacts and collateral as well as simulating the impact of potential market movements.

Table 35: Counterparty credit risk exposure - by exposure class, product and method

	IMM		Mark-to-market method		Total counterparty credit risk	
	Exposure value	RWAs	Exposure value	RWAs	Exposure value	RWAs
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013						
By exposure class						
IRB advanced approach	23.9	8.8	105.7	31.9	129.6	40.7
Central governments and central banks	1.2	0.2	3.0	0.7	4.2	0.9
Institutions	6.7	2.1	58.3	11.4	65.0	13.5
Corporates	16.0	6.5	44.4	19.8	60.4	26.3
IRB foundation approach ...	-	-	3.1	1.5	3.1	1.5
Corporates	-	-	3.1	1.5	3.1	1.5
Standardised approach	1.4	-	9.3	3.6	10.7	3.6
Central governments and central banks	1.4	-	5.1	-	6.5	-
Institutions	-	-	0.5	0.1	0.5	0.1
Corporates	-	-	3.7	3.5	3.7	3.5
	25.3	8.8	118.1	37.0	143.4	45.8

By product						
OTC derivatives	25.3	8.8	80.5	30.2	105.8	39.0
Securities financing transactions	-	-	29.7	4.7	29.7	4.7
Other1	-	-	7.9	2.1	7.9	2.1
	25.3	8.8	118.1	37.0	143.4	45.8
At 31 December 2012						
By exposure class						
IRB advanced approach	24.9	10.0	107.2	33.9	132.1	43.9
Central governments and central banks	2.8	0.3	6.9	0.6	9.7	0.9
Institutions	4.8	1.6	64.1	14.5	68.9	16.1
Corporates	17.3	8.1	36.2	18.8	53.5	26.9
IRB foundation approach	-	-	3.5	1.8	3.5	1.8
Corporates	-	-	3.5	1.8	3.5	1.8
Standardised approach	-	-	5.8	2.6	5.8	2.6
Central governments and central banks	-	-	2.2	-	2.2	-
Institutions	-	-	0.5	-	0.5	-
Corporates	-	-	3.1	2.6	3.1	2.6
	-					
	-					
	24.9	10.0	116.5	38.3	141.4	48.3
By product						
OTC derivatives	24.9	10.0	85.3	33.6	110.2	43.6
Securities financing transactions	-	-	23.8	2.9	23.8	2.9
Other1	-	-	7.4	1.8	7.4	1.8

24.9	10.0	116.5	38.3	141.4	48.3	

1 Includes free deliveries not deducted from regulatory capital.

Key points

- OTC derivative exposures reduced marginally in most regions due to maturing trades and lower volumes, with the exception of Latin America due to higher balance sheet exposures on FX derivatives with corporate counterparties in Brazil.
- RWAs for OTC derivatives reduced in North America due to the improved credit standing of corporate counterparties.
- The increase in exposure for security financing transactions was mainly in Europe, driven by updates to the volatility haircuts.
- RWA density in Institutions under IRB advanced approach decreased from 23% to 21%, mainly due to a decrease in Europe which resulted from the improvement of counterparty credit ratings.
- The decrease in RWA density in corporates under IRB Advanced approach is predominantly a result of the improving internal counterparty credit ratings in North America.
- Some variation in the RWA density values from 2012 to 2013 may result from the small absolute values of Exposures and RWAs.

Table 36: Counterparty credit risk exposure - by exposure class, product and geographical region

	Exposure value						
	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013							
By exposure class							
IRB advanced approach	68.3	19.6	14.0	0.3	25.7	1.7	129.6
Central governments and central banks	2.3	0.2	0.6	-	0.7	0.4	4.2
Institutions	29.3	15.6	7.1	0.3	11.4	1.3	65.0
Corporates	36.7	3.8	6.3	-	13.6	-	60.4

IRB foundation approach	2.9	-	-	0.2	-	-	3.1
Corporates	2.9	-	-	0.2	-	-	3.1
Standardised approach	5.8	0.2	0.1	2.3	-	2.3	10.7
Central governments and central banks	4.7	-	-	1.8	-	-	6.5
Institutions	0.4	-	-	0.1	-	-	0.5
Corporates	0.7	0.2	0.1	0.4	-	2.3	3.7
	77.0	19.8	14.1	2.8	25.7	4.0	143.4
By product							
OTC derivatives	51.5	13.8	13.4	1.0	22.9	3.2	105.8
Securities financing transactions	23.4	0.2	0.7	1.8	2.8	0.8	29.7
Other	2.1	5.8	-	-	-	-	7.9
	77.0	19.8	14.1	2.8	25.7	4.0	143.4
At 31 December 2012							
By exposure class							
IRB advanced approach	65.9	19.9	15.6	0.8	27.4	2.5	132.1
Central governments and central banks	6.8	0.5	1.1	-	0.3	1.0	9.7
Institutions	32.6	13.9	7.6	0.8	12.5	1.5	68.9
Corporates	26.5	5.5	6.9	-	14.6	-	53.5
IRB foundation approach	3.2	-	-	0.3	-	-	3.5
Corporates	3.2	-	-	0.3	-	-	3.5
Standardised approach ..	2.2	-	-	2.0	-	1.6	5.8
Central governments and central banks	0.9	-	-	1.3	-	-	2.2
Institutions							

	0.4	-	-	0.1	-	-	0.5
Corporates	0.9	-	-	0.6	-	1.6	3.1
	71.3	19.9	15.6	3.1	27.4	4.1	141.4
By product							
OTC derivatives	52.0	14.0	15.1	1.2	25.1	2.8	110.2
Securities financing transactions	17.7	0.1	0.5	1.9	2.3	1.3	23.8
Other	1.6	5.8	-	-	-	-	7.4
	71.3	19.9	15.6	3.1	27.4	4.1	141.4

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

	RWAs						
	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
At 31 December 2013							
By exposure class							
IRB advanced approach	20.8	5.0	5.6	0.2	8.5	0.6	40.7
Central governments and central banks	0.4	-	0.2	-	0.2	0.1	0.9
Institutions	6.8	2.6	1.4	0.2	2.0	0.5	13.5
Corporates	13.6	2.4	4.0	-	6.3	-	26.3
IRB foundation approach	1.4	-	-	0.1	-	-	1.5
Corporates	1.4	-	-	0.1	-	-	1.5
Standardised approach	0.8	0.2	0.1	0.4	-	2.1	3.6
Central governments and			-				

central banks	-	-		-	-	-	-
Institutions	-	-	-	0.1	-	-	0.1
Corporates	0.8	0.2	0.1	0.3	-	2.1	3.5
	23.0	5.2	5.7	0.7	8.5	2.7	45.8
By product							
OTC derivatives	18.4	4.4	5.5	0.6	7.8	2.3	39.0
Securities financing transactions	3.3	-	0.2	0.1	0.7	0.4	4.7
Other	1.3	0.8	-	-	-	-	2.1
	23.0	5.2	5.7	0.7	8.5	2.7	45.8
At 31 December 2012							
By exposure class							
IRB advanced approach	20.4	5.3	5.9	0.2	11.3	0.8	43.9
Central governments and central banks	0.5	0.1	0.1	-	0.1	0.1	0.9
Institutions	9.4	2.1	1.5	0.2	2.2	0.7	16.1
Corporates	10.5	3.1	4.3	-	9.0	-	26.9
IRB foundation approach	1.6	-	-	0.2	-	-	1.8
Corporates	1.6	-	-	0.2	-	-	1.8
Standardised approach	0.5	-	-	0.6	-	1.5	2.6
Central governments and central banks	-	-	-	-	-	-	-
Institutions	-	-	-	-	-	-	-
Corporates	0.5	-	-	0.6	-	1.5	2.6
	22.5	5.3	5.9	1.0	11.3	2.3	48.3

By product							
OTC derivatives	19.6	4.4	5.7	0.9	10.9	2.1	43.6
Securities financing transactions	1.9	0.1	0.2	0.1	0.4	0.2	2.9
Other	1.0	0.8	-	-	-	-	1.8
	22.5	5.3	5.9	1.0	11.3	2.3	48.3

Table 38: Counterparty credit risk - RWA density by exposure class, product and geographical region

	RWA density						
	Europe	Hong Kong	Rest of Asia-Pacific	MENA	North America	Latin America	Total
	%	%	%	%	%	%	%
At 31 December 2013							
By exposure class							
IRB advanced approach							
Central governments and central banks	20	-	27	-	23	21	22
Institutions	24	17	20	41	17	34	21
Corporates	37	64	65	-	46	-	44
IRB foundation approach							
Corporates	48	-	-	54	-	-	48
Standardised approach							
Central governments and central banks	-	-	-	-	-	-	-
Institutions	-	-	-	42	-	-	12
Corporates	97	100	100	98	100	95	96
Total	30	27	40	23	33	67	32
By product							

OTC derivatives	36	32	41	62	34	72	37
Securities financing transactions	14	-	31	3	26	47	16
Other	61	14	-	-	-	-	27
Total	30	27	40	23	33	67	32
At 31 December 2012							
By exposure class							
IRB advanced approach							
Central governments and central banks	7	22	11	-	22	15	9
Institutions	29	16	20	23	18	41	23
Corporates	40	54	62	-	62	-	50
IRB foundation approach							
Corporates	48	-	-	70	-	-	50
Standardised approach							
Central governments and central banks	-	-	-	-	-	-	-
Institutions	-	-	-	-	-	-	-
Corporates	62	-	-	97	-	95	86
Total	31	27	38	32	42	56	34
By product							
OTC derivatives	38	32	38	70	44	70	40
Securities financing transactions	11	20	24	7	18	26	12
Other	63	14	-	-	-	-	24
Total	31	27	38	32	42	56	34

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 such as where the 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 when the exposure to a particular counterparty is positively correlated with the probability of counterparty default such as a reverse repo on the counterparty's own bonds. HSBC policy sets out 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 the monitoring process. This includes the monthly submission of wrong-way risk information to the GB&M Risk Management Committee.

Central counterparties

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

A dedicated CCP credit 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

Group securitisation strategy

HSBC acts as originator, sponsor, liquidity provider and derivative counterparty to its own originated and sponsored securitisations, as well as those of third-party securitisations. Our strategy is to use securitisations 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 have senior exposures to the securities investment conduits ('SIC's): Mazarin Funding Limited, Barion Funding Limited, Malachite Funding Limited and Solitaire Funding Limited. These are not considered core businesses, and exposures are being repaid as the securities they hold amortise.

Group securitisation roles

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 providederivatives 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. This activity is conducted in a number of regions and across a number of asset classes. We also act as a derivative counterparty. Credit enhancements to the underlying assets may be used to obtain investment grade ratings on the senior debt issued by the SPEs. The majority of these securitisations are consolidated for accounting purposes (see page 77 for the regulatory treatment). We have also established multi-seller conduit securitisation programmes for the purpose of providing access to flexible market-based sources of finance for our clients to finance discrete pools of third-party originated trade and vehicle finance loan receivables.

In addition, we use SPEs to mitigate the capital absorbed by some of our 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 securitisations commonly known as synthetic securitisations by which the SPE writes CDS protection to HSBC. These SPEs are consolidated for accounting purposes when the substance of the relationship indicates that we control them.

HSBC as sponsor

We are sponsor to a number of types of securitisation entity, including:

- a multi-seller conduit vehicle established to provide finance to clients - Regency Assets Limited - to which we provide senior liquidity facilities and programme-wide credit enhancement. Transactions previously funded via the Bryant Park conduit in the US have now largely been transferred to Regency Assets Limited and Bryant Park is no longer active; and

- four SICs established to provide tailored investments to third-party clients, backed primarily by senior tranches of securitisations and securities issued by financial institutions. Solitaire Funding Limited and Mazarin Funding Limited are asset-backed commercial paper conduits to which we provide transaction-specific liquidity facilities; Barion Funding Limited and Malachite Funding Limited are vehicles to which we provide senior term funding. We also provide a first loss letter of credit to Solitaire Funding Limited. The performance of our exposure to these vehicles is primarily subject to the credit risk of the underlying securities.

Further details of these entities may be found on page 550 of the Annual Report and Accounts 2013.

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 that are expected to be held to maturity.

These 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.

Valuation of securitisation positions

The valuation process of our investments in securitisation exposures primarily focuses on quotations from third parties, observed trade levels and calibrated valuations from market standard models. This process did not change in 2013.

We perform hedging in respect of our sponsored SICs interest rate and currency exposures. Credit risk is hedged by credit default swaps in respect of some securitisation positions.

Securitisation accounting treatment

For accounting purposes, we consolidate SPEs when the substance of the relationship indicates that we control them. In assessing control, all relevant factors are considered, including qualitative and quantitative aspects.

Full details of these assessments may be found on page 430 of the Annual Report and Accounts 2013.

We reassess the required consolidation whenever there is a change in the substance of the relationship between HSBC and an SPE, for example, when the nature of our involvement or the governing rules, contractual arrangements or capital structure of the SPE change.

The transfer of assets to an SPE may give rise to the full or partial derecognition of the financial assets concerned. Only in the event that derecognition is achieved are sales and any resultant gains on sales recognised in the financial statements. In a traditional securitisation, assets are sold to an SPE and no gain or loss on sale is recognised at inception.

Full derecognition occurs when we transfer our contractual right to receive cash flows from the financial assets, or retain the right but assume an obligation to pass on the cash flows from the assets, and transfer substantially all the risks and rewards of ownership. The risks include credit, interest rate, currency, prepayment and other price risks.

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 but control is retained. These financial assets are recognised on the balance sheet to the extent of our continuing involvement.

A small portion of financial assets that do not qualify for derecognition relate to loans, credit cards, debt securities and trade receivables that have been securitised under arrangements by which we retain a continuing involvement in such transferred assets. Continuing involvement may entail retaining the rights to future cash flows arising from the assets after investors have received their contractual terms (for example, interest rate strips); providing subordinated interest; liquidity support; continuing to service the underlying asset; or entering into derivative transactions with the securitisation vehicles. As such, we continue to be exposed to risks associated with these transactions.

Where assets have been derecognised in whole or in part, the rights and obligations that we retain from our continuing involvement in securitisations are initially recorded as an allocation of the fair value of the financial asset between the part that is derecognised and the part that continues to be recognised on the date of transfer.

Securitisation regulatory treatment

For regulatory purposes, where significant risk in SPEs has been transferred to third parties, these SPEs are not consolidated but exposure to them, including derivatives or liquidity facilities, is risk-weighted as securitisation positions. Of the US$1.6bn (2012: US$2.2bn) of unrealised losses on AFS asset-backed securities disclosed in the Annual Report and Accounts 2013, US$0.1bn (2012: US$0.8bn) relates to assets within SPEs that are not consolidated for regulatory purposes. The remainder is subject to the PRA's prudential filter that removes unrealised gains and losses on AFS debt securities from capital and also adjusts the exposure value of the positions by the same

amount before the relevant risk weighting is applied.

Analysis of securitisation exposures

Securitisation exposures analysed below are on a regulatory consolidated basis and include those deducted from capital, rather than risk-weighted.

Table 39: Securitisation exposure - by approach

	31 December 2013			31 December 2012		
	Trading book	Non-trading book	Total	Trading book	Non-trading book	Total
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
IRB approach	2.6	48.6	51.2	2.7	52.5	55.2
Ratings based	2.6	31.1	33.7	2.7	38.2	40.9
Internal assessment approach	-	17.1	17.1	-	13.9	13.9
Supervisory method	-	0.4	0.4	-	0.4	0.4
Standardised	-	0.4	0.4	-	0.1	0.1
	2.6	49.0	51.6	2.7	52.6	55.3

The movement in the year represents any purchase or sale of securitisation assets, the repayment of capital on amortising or maturing securitisation assets, the inclusion of trading book assets when their credit ratings fall below investment grade and the revaluation of these assets. Movements in the year also reflect the re-assessment of assets no longer treated under the securitisation framework. When assets within re-securitisations are re-securitised to achieve a more granular rating, there is no change in the exposure value, and so no movement in the year is reported.

Table 40: Securitisation exposure - movement in the year

		Movement in year			
	Total at 1 January	As originator	As sponsor	As investor	Total at 31 December

	US$bn	US$bn	US$bn	US$bn	US$bn
2013					
Aggregate amount of securitisation exposures					
Residential mortgages	4.2	-	-	(1.7)	2.5
Commercial mortgages	3.9	-	(0.3)	1.2	4.8
Loans to corporates or SMEs	0.2	-	-	-	0.2
Consumer loans	0.7	-	-	(0.3)	0.4
Trade receivables	14.2	-	3.6	(0.1)	17.7
Re-securitisations1	31.6	(0.4)	(3.8)	(1.8)	25.6
Other assets	0.5	-	(0.1)	-	0.4
	55.3	(0.4)	(0.6)	(2.7)	51.6
2012					
Aggregate amount of securitisation exposures					
Residential mortgages	12.9	-	-	(8.7)	4.2
Commercial mortgages	4.6	-	-	(0.7)	3.9
Loans to corporates or SMEs	16.4	-	(16.2)	-	0.2
Consumer loans	0.8	-	-	(0.1)	0.7
Trade receivables	15.2	-	(0.9)	(0.1)	14.2
Re-securitisations1	36.7	2.7	(5.8)	(2.0)	31.6
Other assets	0.5	-	-	-	0.5
	87.1	2.7	(22.9)	(11.6)	55.3

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

HSBC's involvement in securitisation activities continued to reduce in the year, which is reflected in the following:

- no securitisation positions backed by revolving exposures other than trade receivables in Regency Asset Limited;
- no facilities subject to early amortisation provisions;
- no material positions held as synthetic transactions (2012: nil);
- no assets awaiting securitisation; and
- we do not provide financial support for securitised assets.

Realised losses were US$0.3bn (2012: US$0.4bn) on securitisation asset disposals during the year. Total exposure includes off-balance sheet assets of US$27.3bn (2012: US$26.1bn) which relate to liquidity lines to securitisation vehicles.

Table 41: Securitisation exposure - by trading and non-trading book

	At 31 December 2013			At 31 December 2012		
	Trading book US$bn	Non-trading book US$bn	Total US$bn	Trading book US$bn	Non-trading book US$bn	Total US$bn
As originator						
.....	-	2.4	2.4	-	2.7	2.7
Re-securitisations						
.....	-	2.4	2.4	-	2.7	2.7
As sponsor						
.....	-	39.2	39.2	-	39.9	39.9
Commercial mortgages						
.....	-	-	-	-	0.3	0.3
Loans to corporates or						
SMEs	-	-	-	-	-	-
Trade receivables						
.....	-	17.1	17.1	-	13.6	13.6
Re-securitisations						
.....	-	21.7	21.7	-	25.5	25.5
Other assets						
.....	-	0.4	0.4	-	0.5	0.5
As investor						
.....	2.6	7.4	10.0	2.7	10.0	12.7
Residential mortgages						
.....	1.1	1.4	2.5	1.7	2.5	4.2
Commercial mortgages						
.....	0.9	3.9	4.8	0.1	3.5	3.6
Loans to corporates or						
SMEs	-	0.2	0.2	0.2	-	0.2
		0.3			0.6	

Consumer loans	0.1		0.4	0.1		0.7
Trade receivables	-	0.6	0.6	-	0.7	0.7
Re-securitisations	0.5	1.0	1.5	0.6	2.7	3.3
	2.6	49.0	51.6	2.7	52.6	55.3

Table 42: Securitisation exposure - asset values and impairment charges

	At 31 December 2013			At 31 December 2012		
	Underlying assets1		Securitisation exposures	Underlying assets1		Securitisation exposures
	Total	Impaired and past due	impairment	Total	Impaired and past due	impairment
	US$bn	US$bn	US$bn	US$bn	US$bn	US$bn
As originator	4.1	3.4	0.9	5.2	3.1	1.0
Residential mortgages	0.4	-	-	0.3	-	-
Commercial mortgages	-	-	-	0.5	-	-
Re-securitisations2	3.7	3.4	0.9	4.4	3.1	1.0
As sponsor	37.9	0.3	0.3	45.7	0.3	0.2
Commercial mortgages	2.3	-	-	2.3	-	-
Loans to corporates and SMEs	-	-	-	-	-	-
Trade receivables	12.9	-	-	13.4	-	-
Re-securitisations2	20.7	0.3	0.3	27.9	0.3	0.2
Other assets	2.0	-	-	2.1	-	-
As investor3			-			-
Residential mortgages			-			-
Commercial mortgages			-			-
Re-securitisations			-			-

1.24 1.2

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 For re-securitisations where HSBC has derived regulatory capital requirements based on the underlying pool of assets, the asset value used for the regulatory capital calculation is used in the disclosure of total underlying assets. For other re-securitisations, the carrying value of the assets per the Annual Report and Accounts 2013 is disclosed.
3 For securitisations where HSBC acts as investor, information on third-party underlying assets is not available.
4 The net effect of a number of insignificant movements, compared with prior year, was immaterial.

Table 43: Securitisation exposure - by risk weighting

	Exposure value1				Capital required			
	Trading book		Non-trading book2		Trading book3		Non-trading book	
	S4 US$bn	R5 US$bn	S4 US$bn	R5 US$bn	S4 US$bn	R5 US$bn	S4 US$bn	R5 US$bn
2013								
Long-term category - risk weights								
- less than or equal to 10%	0.8	-	18.2	-	-	-	0.1	-
- > 10% and ≤ 20%	0.4	-	7.0	0.3	-	-	0.1	-
- > 20% and ≤ 50%	0.4	0.4	1.4	13.6	-	-	-	0.5
- > 50% and ≤ 100%	0.1	-	1.9	0.5	-	-	0.1	-
- > 100% and ≤ 650%	0.3	-	0.3	2.4	0.1	0.1	0.1	0.6
- > 650% and < 1,250%	-	0.1	-	0.1	-	-	-	-
Deductions from capital	0.1	-	1.6	1.7	0.1	-	1.6	1.7
	2.1	0.5	30.4	18.6	0.2	0.1	2.0	2.8
2012								
Long-term category - risk weights								

- less than or equal to 10%	0.9	-	19.1	-	-	-	0.1	-
- > 10% and ≤ 20%	0.2	-	3.7	1.4	-	-	0.1	-
- > 20% and ≤ 50%	0.8	0.4	1.0	17.6	-	-	-	0.6
- > 50% and ≤ 100%	-	-	1.8	0.8	-	-	0.1	0.1
- > 100% and ≤ 650%	0.1	0.2	0.7	2.9	-	0.1	0.3	0.8
- > 650% and < 1,250%	-	-	-	0.1	-	-	-	0.1
Deductions from capital	0.1	-	2.0	1.5	0.1	-	2.0	1.5
	2.1	0.6	28.3	24.3	0.1	0.1	2.6	3.1

1 There are no short-term category exposures at 31 December 2013 (2012: nil).

2 Non-trading book figures at 31 December 2013 include US$0.4bn exposures treated under the Standardised approach (2012: US$0.1bn).

3 Trading book securitisation capital requirements included under the market risk disclosures were US$0.2bn (2012: US$0.1bn).

4 Securitisation.

5 Re-securitisation. The total re-securitisation exposure value is less than that presented in tables 40 and 41, reflecting a differing treatment of Solitaire Funding Limited. In tables 40 and 41, Solitaire is treated as a re-securitisation, while the figures above are based on the fact that Solitaire is consolidated for regulatory purposes, and present the exposure values as securitisations, allocated to the RWA bands of Solitaire's underlying pool of assets.

Key point

- Of the total reduction in securitisation capital requirements to US$5.1bn, US$0.5bn occurred in GB&M in Europe due to a number of drivers including amortisation, rating migration and sales of exposure in the banking book.

Market risk

Overview and objectives

We separate exposures to market risk into trading and non-trading portfolios. Trading portfolios include positions arising from market-making, from position-taking and others designated as marked-to-market. Non-trading portfolios include positions that primarily arise from the interest rate management of our retail and CMB assets and liabilities, financial investments designated as available for sale and those held to maturity.

Where appropriate, we apply similar risk management policies and measurement techniques to both trading and non-trading portfolios. Our objective is to manage and control market risk exposures in order to optimise return on risk while maintaining a market profile consistent with our status as one of the world's largest banking and financial services organisations.

Organisation and responsibilities

The management of market risk is undertaken mainly in Global Markets using risk limits approved by the GMB. Limits are set for portfolios, products and risk types. Market liquidity is an important factor taken into account when setting limits.

Global Risk is responsible for our market risk management policies and measurement techniques. Each major operating entity has an independent market risk management and control function which is responsible for measuring market risk exposures in accordance with the policies defined by Global Risk, and for monitoring and reporting exposures against the prescribed limits on a daily basis.

Each operating entity is required to assess the market risks arising on each product in its business and it is responsible for ensuring that market risk exposures remain within the limits specified for that entity. 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.

Table 44: Market risk

	At 31 December 2013		At 31 December 2012	
	Capital required	RWAs	Capital required	RWAs
	US$bn	US$bn	US$bn	US$bn
At 31 December 2013				
Internal model based	4.2	52.2	3.6	44.5
VaR	0.4	4.9	0.6	7.6
Stressed VaR	0.8	9.4	0.9	11.0
Incremental risk charge	1.8	23.1	0.9	11.1
Comprehensive risk measure	0.2	2.6	0.3	3.4
Other VaR and stressed VaR1	1.0	12.2	0.9	11.4
PRA standard rules	0.9	11.2	0.8	10.4

Interest rate position risk	0.6	7.8	0.6	7.0
Foreign exchange position risk	0.1	1.1	0.1	1.4
Equity position risk	-	0.2	-	0.1
Commodity position risk	-	0.1	-	0.1
Securitisations	0.2	2.0	0.1	1.8
	5.1	63.4	4.4	54.9

1 These are results from countries which cannot be included in the consolidated results because regulatory permission to do so has not been received, and which must therefore be aggregated rather than consolidated.

Key points

- Market Risk RWAs increases were mainly due to model updates in relation to the IRC.
- Further RWA increases were due to a change in the other VaR and stressed VaR period and changes in the basis of consolidation for modelled Market Risk charges as a result of clarification of the regulatory rules.
- Capital required and RWAs decreased in VaR and stressed VaR due to the impact of reductions in positions sensitive to the IRC and changes in the shape of the trading portfolio due to defensive positions taken by the equity and foreign exchange businesses.

Measurement and monitoring

Market Risk across the portfolio is measured, monitored and limited using a range of techniques including sensitivity analysis, VaR, stressed VaR, IRC, CRM and stress testing. See table 45 for a summary of these measures.

The remainder of this section primarily addresses market risks in the trading book, except that foreign exchange position risk and commodity position risk relate to both trading and non-trading books. Other non-trading book market risks are covered under 'Other risks' on page 86.

Further information on Market Risk may be found on page 230 of the Annual Report and Accounts 2013.

Sensitivity analysis

We use sensitivity measures to monitor the market risk positions within each risk type; for interest rate risk, for example, the present value of a basis point movement in interest rates. Sensitivity limits are set for portfolios, products and risk types, with the depth of the market being one of the principal factors in determining the level of limits set.

VaR and stressed VaR

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.

Both the VaR and stressed VaR models we use are based predominantly on historical simulation. These models derive realistic future scenarios from past series of recorded market rates and prices, taking into account inter-relationships between different markets and factors including interest and foreign exchange rates, commodity prices, equity prices and the associated volatilities. The models also incorporate the effect of option features embedded in the underlying exposures.

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. Our VaR models also capture significant basis risk, for example CDS versus bond basis risk.

Results are calculated on a consolidated basis for most regions, producing diversification benefits across risk types for general and specific risks. However, the results of certain countries are aggregated rather than consolidated because regulatory approval has not yet been granted for them to be included in the consolidated results.

We routinely validate the accuracy of our VaR models by backtesting the actual daily profit and loss results, adjusted to remove non-modelled items such as fees and commissions, against the corresponding VaR numbers.

Backtesting is an important measure of the effectiveness of our VaR models. It may reveal potential miscalibration in the VaR model, for example where P&L movements had frequently exceeded the value predicted by the model.

Further information on VaR back-testing may be found on page 233 of the Annual Report and Accounts 2013.

We expect on average to see losses in excess of VaR for 1% of the time over a one-year period. Comparing this to the actual number of excesses over this period can therefore be used to gauge how well the models are performing. A high level of exceptions may lead to a recalibration of the VaR model. On a case by case basis, the PRA may allow loss exceptions to be exempted for regulatory capital purposes. In 2013, there were no exceptions at the Group level that were not exempted by the PRA.

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;

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

- VaR is unlikely to reflect loss potential on exposures that only arise under conditions of significant market movement.

From a capital perspective, these limitations are somewhat mitigated by the addition of stressed VaR, which by definition incorporates 10-day scenarios in a period of stress. Furthermore, an RNIV framework is used to identify and quantify risks not readily captured in VaR. An example of this is Libor-OIS basis risk for minor currencies. In such instances the RNIV framework uses stress tests to quantify the capital requirement. On average in 2013, the capital requirement derived from these stress tests represented 2.3% of the total internal model-based market risk requirement.

Basel 2.5 introduced, via the IRC and Comprehensive Risk Measure detailed below, longer capital and liquidity horizons. Capital add-ons also exist to capture event risk including foreign exchange risk on pegged currencies and concentration risk associated with large equity holdings.

Incremental Risk Charge

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

Risk factors covered by it include credit migration, default, product basis, concentration, hedge mismatch, recovery rate and liquidity. The Probabilities of Default 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 is a standalone charge generating no diversification benefit with other charges.

In 2013, the IRC model was updated to account more explicitly for stressed conditions by calibrating key input parameters to a stressed period. Additionally, further granularity in parameters was introduced, in order to better represent the risk profile. This update has led to a one-time increase in the IRC capital requirement, which is reflected in the current period. As part of normal model oversight the IRC model will be periodically recalibrated in order to continue accurately to capture the risk profile in a stressed environment.

Comprehensive Risk Measure

The CRM is used to measure all price risks emanating from the correlation trading portfolio within the bank.

It also reflects the impact of liquidity, concentration and hedging. In accordance with Basel 2.5, this measure is subject to a minimum capital requirement of 8% of RWA calculated under the standard rules for the portfolio.

The CRM is a standalone charge generating no diversification benefit with other charges.

Stress testing

The risk management framework is augmented with stress testing to evaluate the potential impact on portfolio values of more extreme (but nonetheless realistic) events or movements in a set of financial variables. In such abnormal scenarios, losses can be much greater than those predicted by VaR modelling. A set of broad stress scenarios is used, as well as scenarios tailored to specific businesses and geographic areas.

The scenarios applied at portfolio and consolidated levels are as follows:

- single risk factor stress scenarios consider the impact of any single risk factor or set of factors that are unlikely to be captured within the VaR models, such as the break of a currency peg;

- technical scenarios, which consider the largest movement in each risk factor without considering any underlying market correlation;

- hypothetical scenarios, which consider potential macroeconomic events, for example a mainland China slowdown or the effects of a sovereign debt default, including wider contagion effects;

- historical scenarios, which incorporate historical observations of market movements during previous periods of stress, which would not be captured within VaR, for example, Black Monday 1987 for equities, the 1997 Asian crisis and the 2007 global financial crisis; and

- reverse stress test scenarios, which identify scenarios which are beyond normal business conditions and could result in significant losses due to contagion and systemic implications.

Stress testing is also used as a tool for managing basis risk.

Table 45: Market risk models

Model component	RWAs for associated asset class US$bn	Confidence level	Horizon	Model description and methodology
VaR	4.9	99%	10 day	Uses most recent two years' worth of daily returns to determine a loss distribution. The result is scaled from one day to provide an equivalent 10-day loss.
Stressed Value at Risk	9.4	99%	10 day	Stressed VaR is calibrated to a one-year period of stress observed in history.
IRC	23.1	99.9%	1 year	Uses a multi-factor Gaussian Monte-Carlo simulation is used 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.
CRM	2.6	99.9%	1 year	Calibrated to the same soundness standard as the IRC above, and the risk factors covered include credit migration, default, credit spread, correlation, recovery rate and basis risks.

Managed risk positions

Interest rate position risk

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

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

Through our management of market risk in non-trading portfolios, we mitigate the effect of prospective interest rate movements which could reduce future net interest income, while balancing the cost of such hedging activities on the current net revenue stream. Further information on non-trading book interest rate risk can be found on page 87.

Analysis of interest rate risk is complicated by having to make assumptions on embedded optionality within certain product areas such as the incidence of mortgage prepayments.

Foreign exchange position risk

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

Specific issuer risk

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

Equity position risk

Equity position risk arises from the holding of open positions, either long or short, in equities or equity based instruments, which create exposure to a change in the market price of the equities or underlying equity instruments. As well as VaR and stress testing, we control the equity risk within our trading portfolios by limiting the size of the net open equity exposure.

SIGNATURE

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:

Name: Ben J S Mathews

Title: Group Company Secretary

Date: 24 February 2014