Basel III: Finalising post-crisis reforms

Basel Committee on Baking Supervision (BCBS)

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List of abbreviations

Abbr[1].	Meaning
ADC	Land Acquisition, Development and Construction
A-IRB	Advanced-Internal Ratings-Based
AMA	Advanced Measurement Approach
AUD	Australian dollar
BA-CVA	Basic Approach for Credit Valuation Adjustment
BCBS	Basel Committee on Banking Supervision
BI	Business Indicator
BIC	Business Indicator Component
CAD	Canadian dollar
CCF	Credit Conversion Factor
CCP	Central Counterparty
CCR	Counterparty Credit Risk
CDS	Credit Default Swaps
CET1	Common Equity Tier 1
CF	Commodities Finance
CM	Clearing Member
CPs	Consultation Papers
CRE	Commercial Real State
CRM	Credit Risk Mitigation
CVA	Credit Valuation Adjustment
DF	Discount Factor

Abbr.	Meaning
EAD	Exposure at default
ECA	Export Credit Agencies
ECAI	Eligible Credit Assessment Institution
ECRA	External Credit Risk Assessment Approach
EL	Expected losses
EUR	Euro
FC	Financial component
F-IRB	Foundation-Internal Ratings-Based
FX	Foreign Exchange
GBP	British pound
G-SIB	Global Systemically-Important Bank
HMA	Hedging Misalignment Parameter
HVCRE	High-Volatility Commercial Real Estate
HY	High Yield
IG	Investment Grade
IH	Index Hedges
ILDC	Interest Leases and Dividend Component
ILM	Internal Loss Multiplier
IMM	Internal Models Method
IPRE	Income-Producing Eeal Estate
IRB	Internal-Ratings Based

(1) Abbreviations.

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List of abbreviations

Abbr.	Meaning
JPY	Japanese yen
LC	Loss Component
LCR	Liquidity Coverage Ratio
LGD	Loss Given Default
LR	Leverage Ratio
LTV	Loan-to Value
M	Maturity
MDB	Multilateral Development Bank
MPoR	Margin Period of Risk
NIF	Note Issuance Facilities
NR	Not Rated
NSFR	Net Stable Funding Ratio
OBS	Off-Balance Sheet
OF	Object Finance
ORC	Operational Risk Capital
OTC	Over-the-Counter
PD	Probability of Default
PF	Project Finance
PFE	Potential Future Exposure
PSE	Public Sector Entity
QRRE	Qualifying Revolving Retail Exposure

Abbr.	Meaning
RC	Replacement Cost
RRE	Residential Real Estate
RUF	Revolving Underwriting Facilities
RW	Risk Weight
RWA	Risk-Weighted Assets
SA	Standardised Approach
SA-CCR	Standardised Approach for Counterparty Credit Risk
SA-CVA	Standardised Approach for Credit Valuation Adjustment
SA-TB	Standardised Approach for Market Risk
SC	Services Component
SCRA	Standardised Credit Risk Assessment Approach
SCVA	CVA Capital Requirement
SEC-ERBA	Securitisation-External Ratings-Based Approach
SEC-SA	Securitisation-Standardised Approach
SEK	Swedish krona
SL	Specialised Lending
TB	Trading Book
TLAC	Total Loss-Absorbing Capacity
USD	US dollar
UCC	Unconditionally Cancellable Commitments
WS	Weighted Sensitivities

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Index

Introduction

Executive summary

Detail

Next steps

Annex

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Introduction

In December 2017 the BCBS published Basel III: finalising post-crisis reform which includes revisions to the current Basel III framework in order to reduce excessive variability of RWAs

Introduction

In December 2010, the BCBS published the Basel III framework with the aim at addressing a number of shortcomings with the pre-crisis regulatory framework and providing a regulatory foundation for a resilient banking system that supports the real economy.

Since then, the BCBS has published several consultation papers focused on strengthening the current regulatory framework by: i) improving the quality of bank regulatory capital by placing a greater focus on going-concern loss-absorbing capital in the form of CET1 capital; ii) increasing the level of capital requirements to ensure that banks are sufficiently resilient to withstand losses in times of stress; iii) enhancing risk capture by revising areas of the RW capital framework that proved to be acutely miscalibrated, including the global standards for market risk, counterparty credit risk and securitisation; iv) adding macroprudential elements to the regulatory framework (e.g. capital buffers, a large exposure regime); v) specifying a LR requirement; and vi) introducing a LCR and NSFR requirements.

- In this context, the BCBS published in December 2017 the **Basel III: finalising post-crisis reform** which includes revisions to the current Basel III framework in order to reduce excessive variability of RWAs. In particular, these revisions to the regulatory framework will help restore credibility in the calculation of RWA by:
  - Enhancing the robustness and risk sensitivity of the **standardised approaches for credit risk** and **operational risk**, which will facilitate the comparability of banks' capital ratios.
  - **Constraining the use of internally modelled approaches**.
  - Complementing the **risk-weighted capital ratio** with a **finalised LR** and a revised and robust **capital floor**.

This **Technical Note** includes a summary of the reforms introduced by the BCBS on the Basel III regulatory framework.

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Index

Introduction

Executive summary

Detail

Next steps

Annex

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Executive summary

This reform package to the regulatory framework covers the following aspects: SA and IRB approaches for credit risk, the CVA risk framework, the operational risk framework, the output floor, as well as the LR framework

Executive summary

Scope of application

- All **internationally active banks**

Regulatory context

- **The Basel II framework,** published by the BCBS on June 2006[1]
- **The Basel III framework**, published by the BCBS in December 2010 (rev.2011)[2].

Next steps

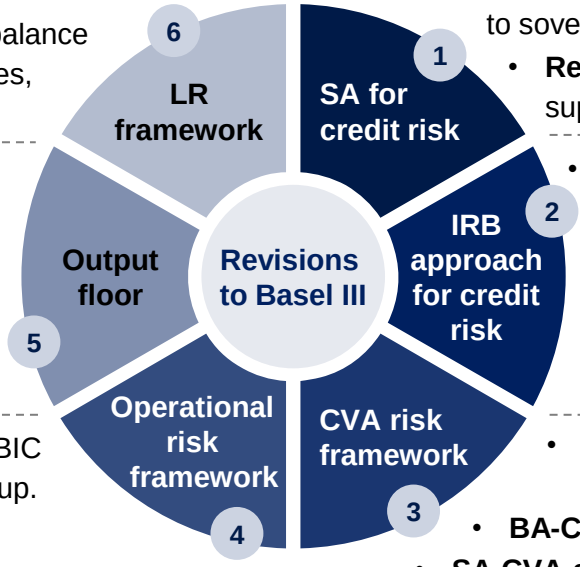
- The revised SA and IRB for credit risk, CVA and operational frameworks will be applicable by **1 January 2022**.
- The LR framework will be applicable by **1 January 2022** (using the revised exposure definition).
- The output floor has been **phased-in** (e.g. 72.5% in 2027).

Main content

- **Definitions** and **requirements**.
- **Exposure measures** regarding on-balance sheet exposures, derivative exposures, SFTs exposures and OBS items.

- **Requirements for the output floor** (CET1, Tier 1 and total capital).
- **Calculation of the output floor**.
- **Disclosure requirements**, **implementation dates** and **transitional measures**.

- **Standardised approach** (including BIC and ILM), and its application in a group.
- **Other aspects** (e.g. general/specific criteria on loss data identification).



- **Revisions to individual exposures** (e.g. exposures to sovereigns, banks, corporate).
  - **Recognition of external ratings** by national supervisors, **CRM techniques**, etc.

- **Mechanics of the IRB approach** (including categorisation of exposures, among others).
  - Rules for **corporate and bank exposures**, for **retail exposures**, and for **purchased receivables**.
  - **Minimum requirements** for IRB approach.

- **General provisions** (including SA-CVA and BA-CVA approaches, CVA hedges, etc.).
- **BA-CVA approach** (full and reduced version).
- **SA-CVA approach** (eligible hedges, calculations, etc.).

(1) International Convergence of Capital Measurement and Capital Standards.
(2) A global regulatory framework for more resilient banks and banking systems.

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Executive summary

Main amendments of the Basel III reforms

The BCBS's revisions to the SA for credit risk enhance the regulatory framework by: i) improving its granularity and risk sensitivity; ii) reducing mechanistic reliance on credit ratings, and iii) providing the foundation for a revised output floor to internally modelled capital requirements

Main amendments (1/3)

SA for credit risk

- The key revisions to this approach, relative to the existing standardised approach are as follows for**:**
  - **Unrated exposures**. A more granular approach has been developed of unrated exposures to banks and corporates, and for rated exposures in jurisdictions where the use of credit ratings is permitted.
  - **Exposure to banks**. Some of the RWs for rated exposures have been calibrated. In addition, the RW treatment for unrated exposures is more granular than the existing flat RW. A standalone treatment for covered bonds has also been introduced.
  - **Exposures to corporates**. A more granular look-up table has been developed. A specific RW applies to exposures to small and medium-sized enterprises or SMEs (i.e. a 85% will be applied for unrated exposures to corporate SMEs and a 75% for exposures to SMEs that are treated as regulatory retail SME exposures).
  - **Residential real estate exposures**. More risk-sensitive approaches have been developed, whereby RWs vary based on the LTV ratio of the mortgage (instead of the existing single RW) and in ways that better reflect differences in market structures.
  - **Retail exposures**. A more granular RW treatment applies, which distinguishes between different types of retail exposures (e.g. the regulatory retail portfolio distinguishes between revolving facilities and transactors).
  - **Commercial real estate exposures**. Approaches have been developed that are more risk-sensitive than the flat RW which generally applies.
  - **Subordinated debt and equity exposures**. A more granular RW treatment applies (relative to the current flat RW).
  - **Off-balance sheet items**. The CCFs, which are used to determine the amount of an exposure to be risk-weighted, have been made more risk-sensitive, including the introduction of positive CCFs for UCCs.

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Executive summary

Main amendments of the Basel III reforms

The BCBS has made the following revisions to the IRB approaches: i) removed the option to use the A-IRB approach for certain asset classes, ii) adopted input floor for PD and LGD, and iii) provided greater specification of parameter estimation practices

Main amendments (2/3)

IRB approach for credit risk[1]

- **Remove the use of the A-IRB approach for certain asset classes** (e.g. exposures to large and mid-size corporates, to banks and other financial institutions). As a result, banks with supervisory approval will use the F-IRB approach. Further, all IRB approaches are being removed for exposures to equities.
- **Specify the input floors**. Introduces minimum "floor" values for bank-estimated IRB parameters that are used as inputs to the calculation of RWA. These include PD floors for both F-IRB and A-IRB (e.g. 5bp for corporate assets), and LGD and EAD floors for the A-IRB approach (e.g. 25% unsecured LGD for corporate, and a EAD floor for corporate and retail assets, respectively).
- **Additional enhancements**. Includes providing greater specification of the practices that banks may use to estimate their model parameters in the F-IRB approach (e.g. for unsecured exposures, reducing the LGD parameter from 45% to 40% for exposures to non-financial corporates).

Exposure class	Methods available under the new credit standards	Change in available methods relative to current credit risk standard
Banks and other financial institutions	SA or F-IRB	A-IRB removed
Corporates belonging to groups with total consolidated revenues exceeding EUR 500m	SA or F-IRB	A-IRB removed
Other corporates	SA, F-IRB or A-IRB	No change
Specialised lending	SA, supervisory slotting, F-IRB or A-IRB	No change
Retail	SA or A-IRB	No change
Equity	SA	All IRB approaches removed

(1) On implementation of the revisions to the risk-weighted framework outlined in this standard and the revised output floor, the 1.06 scaling factor that applies to the RWA amounts for credit risk under the IRB approach will no longer apply.

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Executive summary

Main amendments of the Basel III reforms

Further, the BCBS has reviewed the CVA risk, the operational risk and the leverage ratio frameworks. It has also introduced an output floor that will reach a 72.5% of the total RWAs calculated using the standardised approaches

Main amendments (3/3)

CVA risk framework

- **Enhancement of risk sensitivity**. Considers the exposure component of CVA risk and its associated hedges.
- **Strengthening its robustness**. Removes the internally modelled approach, and includes a standardised approach and a basic approach.
- **Improvement of consistency**. Establishes a standardised CVA approach based on fair value sensitivities to market risk factor s and the basic approach is benchmarked to the standardised approach.

Operational risk framework

- **Remove the AMA** and **the existing three standardised approaches** for calculating operational risk capital requirements.
- **Single risk-sensitive standardised approach**. Introduces a single risk-standardised approach to be used by all banks, which determines a bank's operational risk capital requirements based on two components: the Business Indicator Component (BIC), and the Internal Loss Multiplier (ILM).

LR framework

- **Buffer for G-SIBs**, which must be met with Tier 1 capital and is set at 50% of a G-SIB's risk-weighted higher-loss absorbency requirements (e.g. a G-SIB subject to a 2% risk-weighted higher-loss absorbency requirement would be subject to a 1% LR buffer requirement).
- **Refine the LR exposure measure**. Modifies the way in which derivatives are reflected in the exposure measure and updating the treatment of off-balance sheet exposures to ensure consistency with their measurement in the SA to credit risk, among others.

Output floor

- **Banks' RWAs** must be calculated as the higher of: i) total RWAs calculated using approaches that the bank has supervisory approval to use (including both standardised and internal model-based approaches); and ii) 72.5% of the total RWAs calculated using only the standardised approaches.
- **Standardised approaches to be used**: credit risk, counterparty credit risk, CVA risk, securitisation framework, market risk and operational risk.

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Index

Introduction

Executive summary

Detail

Next steps

Annex

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Detail
SA for credit risk

The BCBS has reviewed the SA for credit risk by considering the following exposures: to sovereigns; non-central government public sector entities; MDBs…

Individual exposures[1] (1/8)

Exposures to sovereigns

- The treatment of exposures to sovereigns and their central banks remains **unchanged from the Basel II framework** (June 2006). Therefore, the RWs will be as follows:

Exposures to non-central govern. PSEs

- The treatment of exposures to domestic PSEs remains **unchanged from the Basel II framework** (June 2006), although only minor editorial changes have been made.

Exposures to MDBs

- A **0% RW** will be applied to exposures to MDBs that fulfil the following **BCBS's eligibility criteria**:
  - **Very high-quality long-term issuer ratings** (i.e. a majority of n MDB's external ratings must be AAA).
  - Either the shareholder structure comprises a significant proportion of sovereigns with long-term issuer external ratings of **AA– or better**, or the majority of the MDB's fund-raising is in the form of **paid-in equity/capital** and there is little or no leverage.
  - **Strong shareholder support** (e.g. amount of paid-in capital contributed by the shareholders).
  - **Adequate level of capital and liquidity** (case-by-case approach).
  - **Strict statutory lending requirements** and **conservative financial policies**.
- For exposures to all other MDBs, banks incorporated in jurisdictions that **allow external ratings** these exposures will be risk-weighted according to the following table:

RW table for MDB exposures						
External rating of the counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
'Base' RW	20%	30%	50%	100%	150%	50%

- Banks incorporated in jurisdictions that do **not allow external ratings** will apply a **50% RW**.

(1) Consistent with the BCBS's guidance on the assessment of credit risk (June 2006), banks must perform due diligence to ensure that they have an adequate understanding, at origination and thereafter on a regular basis of the risk profile and characteristics of their counterparties.

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Detail
SA for credit risk

…exposures to banks in which the RWs are applied according to two approaches (i.e. ECRA and SCRA);…

Individual exposures (2/8)

Exposures to banks

- These exposures are defined as **claims** (including loans and senior debt instruments, unless considered as subordinated debt) **on any financial institution** that is licensed to take deposits and is subject to appropriate prudential standards and level of supervision. The RWs applied are based on two approaches:

ECRA

- This approach is for banks incorporated in jurisdictions that allow the use of external **ratings** for regulatory purposes. It applies to **all rated exposures to banks** which are risk weighted according to the external ratings, as provided in the following table:

RW table for bank exposures (ECRA)					
External rating of counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-
'Base' RW	20%	30%	50%	100%	150%
RW for short-term exposures[1]	20%	20%	20%	50%	150%

SCRA

- This approach is for all exposures of banks incorporated in jurisdictions that do **not allow the use of external ratings** for regulatory purposes, and for **unrated exposures to banks** from jurisdictions that allow the use of external ratings. The SCRA requires bank to classify bank exposures into one of three risk-weight buckets (i.e. Grades A, B and C) and assign the corresponding risk weights of the following table:

RW table for bank exposures (SCRA)			
Credit risk assessment of counterparty	Grade A	Grade B	Grade C
'Base' RW	40%[2]	75%	150%
RW for short-term exposures[1]	20%	50%	150%

- **Grade A**: where the counterparty has adequate capacity to meet their financial commitments in a timely manner, for the projected life of assets.
- **Grade B:** where the counterparty is subject to substantial risk.
- **Grade C:** where the counterparty has material default risks and limited margins of safety.

(1) Exposures to banks with an original maturity of three months or less, as well as exposures to banks that arise from the movement of goods across national borders with an original maturity of six months or less can be assigned the risk weights for short term exposures.
(2) A 30% RW will be applied if the counterparty bank has ≥ 14% of CET1 and ≥ 5% of Tier 1 LR.

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…exposures to covered bonds; exposures to securities firms and other financial institutions;…

Individual exposures (3/8)

Exposures to covered bonds

- To be **eligible for the applicable RWs**:
  - The underlying assets of covered bond shall include, among others, claims on sovereigns, their central banks, PSEs or MDBs, and claims secured by residential real estate with a loan-to-value ratio of 80% or lower. Further, the nominal value of the pool of assets assigned to the covered bond instrument(s) by its issuer should **exceed its nominal outstanding value by at least 10%[1].**
  - The investing in the covered bonds shall demonstrate to its national supervisors that certain **disclosure requirements** are met (e.g. it receives portfolio information on the value of the cover pool and outstanding covered bonds, the issuer makes the above mentioned information available to the bank at least semi-annually.
- **Covered bonds that meet these criteria** and **rated covered bonds** shall be risk-weighted based on the issue-specific rating or the issuer's RW according to the first table. For **unrated covered bonds**, the RW would be inferred from the issuer's ECRA or SCRA's RW, as set out in the second table.

1. RW table for rated covered bond exposures					
Issue-specific rating of the covered bond	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-
'Base' RW	10%	20%	20%	50%	100%

2. RW table for rated covered bond exposures							
RW of the issuing bank	20%	30%	40%	50%	75%	100%	150%
'Base' RW	10%	15%	20%	25%	35%	50%	100%

Exposures to securities firms and other inst.

- These exposures **will be treated as exposures to banks** provided that these firms are subject to prudential standards and a level of supervision equivalent to those applied to banks (including capital and liquidity requirements), which will be determined by national supervisors.
- **Exposures to all other** securities firms and financial institutions will be treated as **exposures to corporates**.

(1) The conditions must be satisfied at the inception of the covered bond and throughout its remaining maturity.

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Detail
SA for credit risk

…exposures to corporates distinguishing between general corporate exposures and specialised lending exposures;…

Individual exposures (4/8)

Exposures to corporates

- These exposure include **loans**, **bonds**, **receivables**, etc., to incorporated entities, associations, partnerships, proprietorships, trusts, funds and other entities with similar characteristics, as well as exposures to insurance companies and other financial corporates or securities firms. These exposures are classified in:

General corporate exposures

- For corporate exposures of banks incorporated in jurisdictions that **allow the use of external ratings** for regulatory purposes, banks will assign "base" RW according to the following table:

RW table for corporate exposures (jurisdictions that use external ratings)						
External rating of the counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	Below BB-	Unrated
'Base' RW	20%	50%	75%	100%	150%	100%

- **Unrated corporate exposures** of banks incorporated in jurisdictions that allow the use of external ratings will receive a 100% RW, with the exception of those to corporate SMEs.
- Banks incorporated in jurisdictions that do **not allow the use of external ratings** will assign a 100% RW to all corporate exposures with the exception of: i) exposures to corporates identified as investment grade[1] (i.e. a 65% RW is applied), and ii) exposures to corporate SMEs (i.e. a 85% RW and a 75% RW is applied to unrated and retail SME exposures, respectively).

Specialised lending exposures

- These exposures are those where lending possesses **some characteristics** (e.g. the exposure is not related to real estate, it is typically to an entity that finances of operates physical assets).
- The banks incorporated in jurisdictions that **allow the use of external ratings** will assign to these exposures the RW determined by the issue-specific external ratings (above table) but not issuer ratings.
- Where an issue-specific external rating is available, and regarding those of banks from jurisdictions that do **not allow external ratings**, the RW applied is: **100%** for object and commodities finance exposures, **130%** for project finance exposures during the pre-operational and **100%** during the operational phases. For project finance exposures in the operational phase which are high quality, a **80% RW** is applied.

(1) i.e. corporate entity with adequate capacity to meet its financial commitments in a timely manner and its ability to do so is robust against adverse changes in economic cycle and business condition.

(2) i.e. corporate exposures where the reported annual sales for the consolidated group of which the corporate counterparty is a part is less than or equal to €50 million for the most recent financial year.

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Detail
SA for credit risk

…exposures including subordinated debt, equity and other regulatory capital instruments; retail exposures;…

Individual exposures (5/8)

Subordinated debt, equity and other capital

- These exposure include **subordinated debt, equity and other regulatory capital instruments** issued by either corporates or banks, provided that such instruments are not deducted from regulatory capital or risk-weighted at **250%**.
- **Equity exposures** include both direct and indirect ownership interests, whether voting or non-voting, in the assets and income of a commercial enterprise or of a financial institution that is not consolidated or deducted. An instrument is consider as an equity exposure if certain requirements are met: i) it is irredeemable; ii) it does not embody an obligation on the part of the issuer; and iii) it conveys a residual claim on the assets or income of the issuer. Additionally, other instruments must be categorised as equity exposures (e.g. an instrument with the same structure as those permitted as Tier 1 capital for banking organisations).
- **Speculative unlisted equity exposures** will be risk weighted at **400%**, and **all other equity holdings at 250%** (excluding those equity holding that provide significant subsidies for the investment to the bank and involve government oversight and restrictions on the equity investment which will be risk weighted at 100%[1]).
- **Subordinated debt and capital instruments other than equities** will be risk weighted at **150%**.

Retail exposures

- These are exposures to an individual person or persons, or to regulatory retail SMEs. To be classified as regulatory retail exposures and be risk-weighted at **75%**, retail exposures shall meet all the following criteria:
  - **Product criterion**: the exposure takes the form of any of the following: revolving credits and lines of credit, personal term loans and small business facilities and commitments.
  - **Low value of exposures**: the maximum aggregated exposure to one counterparty shall be ≤ 1 M€.
  - **Granularity criterion**: no aggregated exposure to one counterparty can exceed 0.2% of the overall regulatory retail portfolio, unless national supervisors ensure satisfactory diversification of the portfolio.
- However, regulatory retail exposures from obligors who qualify as **transactors** will be risk-weighted at **45%**.
- **Other retail exposures** an individual person or persons that do not meet all these criteria will be risk-weighted at **100%**. Exposures to SMEs that do not meet all of these criteria will be treated as corporate SMEs exposures unless secured by real estate.

(1) This treatment can only be accorded to equity holdings up to an aggregate of 10% of the bank's combined Tier 1 and Tier 2 capital.

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…real estate exposures, including those secured by residential real estate,…

Individual exposures (6/8)

Real estate exposures class

- To be risk weighted as real estate exposures, the loan must meet **certain requirements**: i) the property securing the exposure must be fully completed; ii) any claim on the property taken must be legally enforceable in all relevant jurisdictions; iii) the loan is a claim over the property where the lender bank holds a first lien over the property, or a single bank holds the first lien and any sequentially lower ranking lien(s) over the same property; iv) the borrower must meet the requirements regarding its ability to repay; v) the property is valued according to the LTV ratio.

Exposures secured by residential real estate

- Where the above-mentioned requirements are met, the RW to be assigned to the total exposure amount will be determined based on the **exposure's LTV** according to the following table:

Residential real estate exposures (repayment is not materially dependent on cash flows generated by the property)						
	LTV ≤ 50%	50% < LTV ≤ 60%	60% < LTV ≤ 80%	80% < LTV ≤ 90%	90% < LTV ≤ 100%	LTV > 100%
RW	20%	25%	30%	40%	50%	70%

- As an **alternative to the approach**, jurisdictions may apply a **20% RW** to the part of the exposure up to 55% of the property value and the RW of the counterparty to the residual exposure. Nevertheless, the treatment will be different if there are liens that are not hold by the bank.
- For exposures where the above-mentioned requirements are not met the RW applicable will be the **RW of the counterparty**.
- When the prospects for servicing the loan materially depend on the **cash flows generated by the property** securing the loan rather than on the underlying capacity of the borrower to service the debt from other sources, the exposure will be risk weighted as follows[1]: i) if the above-mentioned requirements are met, according to the **LTV ratios** of the following table; and ii) if any of these requirements are not met, at **150%**.

Residential real estate exposures (repayment is materially dependent on cash flows generated by the property)						
	LTV ≤ 50%	50% < LTV ≤ 60%	60% < LTV ≤ 80%	80% < LTV ≤ 90%	90% < LTV ≤ 100%	LTV > 100%
RW	30%	35%	45%	60%	75%	105%

(1) Some exposures are excluded from this treatment and instead, subject to the treatment based on exposure's LTV (e.g. an exposure secured by a property that is the borrower's primary residence).

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Detail
SA for credit risk

…those secured by commercial real estate, and ADC exposures;…

Individual exposures (7/8)

Exposures secured by commercial real estate

- Where the above-mentioned requirements are met, the RW to be assigned to the total exposure amount will be determined based on the **exposure's LTV** according to the following table:

Commercial real estate exposures (repayment is not materially dependent on cash flows generated by the property)		
	LTV ≤ 60%	LTV > 60%
RW	Min (60%, RW of counterparty)	RW of counterparty

- As an **alternative to the approach**, jurisdictions may apply a **60% RW or the RW of the counterparty**, whichever is lower, to the part of the exposure up to 55% of the property value, and the RW of the counterparty to the residual exposure.
- Where any of these requirements are not met, the RW applied will be the **RW of the counterparty**.
- When the prospects for servicing the loan materially depend on the **cash flows generated by the property** securing the loan rather than on the underlying capacity of the borrower to service the debt from other sources, the exposure will be risk weighted as follows[1]: i) if the above-mentioned requirements are met, according to the **LTV ratios** of the following table; and ii) if any of these requirements are not met, at **150%**.

Commercial real estate exposures (repayment is materially dependent on cash flows generated by the property)			
	LTV ≤ 60%	60% < LTV ≤ 80%	LTV > 80%
RW	70%	90%	110%

ADC exposures

- In general terms, these exposures will be risk-weighted at **150%**, unless they meet the following criteria.
- **ADC exposures to residential real estate** may be risk weighted at **100%**, provided that the following criteria are met: i) prudential underwriting standards meet the requirements set out for real estate exposures class; and ii) pre-sale or pre-lease contracts amount to a significant portion of total contracts or substantial equity at risk[1].

(1) Pre-sale or pre-lease contracts must be legally binding written contracts and the purchaser must have made a substantial cash deposit which is subject to forfeiture if the contract is terminated. Equity at risk should be determined as an appropriate amount of borrower-contributed equity to the real estate's appraised as-completed value.

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Detail
SA for credit risk

…exposures with currency mismatch; off-balance sheet items; defaulted exposures; and other assets

Individual exposures (8/8)

Exposures with currency mismatch

- For **unhedged retail** and **residential real estate exposures** to individuals where the lending currency differs from the currency of the borrower's source of income, banks will apply a **1.5 times multiplier** to the applicable RW, subject to a maximum 150% RW.
- For the purposes of application of the multiplier, only **natural or financial hedges** are considered sufficient where they cover at least **90% of the loan instalment**, regardless of the number of hedges.

Off-balance sheet items

- **Off-balance sheet items** will be converted into credit exposure equivalents through the use of CCF. In the case of commitments, the committed but undrawn amount of the exposure would be multiplied by the CCF[1].

	UCCs	ST self-liquidating trade letters of credit arising from the movement of goods	Commitments, except UCCs	NIFs and RUFs, and certain transaction-related contingent items	Direct credit substitutes and other off balance sheet exposures
CCF	10%	40%	50%	20%	100%

Defaulted exposures

- A defaulted exposure is defined as one that is past due for **more than 90 days**, or is an exposure to a defaulted borrower in respect of whom some events have occurred (same definition as IRB approach).
- For **retail exposures**, the default by a borrower on one obligation does not imply default of all others.
- With the exception of residential real estate exposures, the **unsecured or unguaranteed portion of a defaulted exposure** shall be risk-weighted net of specific provisions and partial write-offs as follows: i) **150% RW** when specific provisions are less than 20% of the outstanding amount of the loan; and ii) **100% RW** when specific provisions are equal or greater than 20% of the outstanding amount of the loan.
- For **defaulted residential real estate exposures** where repayments do not materially depend on cash flows generated by the property securing the loan, a **100% RW** shall be applied.

Other assets

- As a general rule, a **100% RW** is applied to all other assets. However, there are exceptions:
  - A **0% RW** will apply to cash owned and held at the bank or in transit; and gold bullion.
  - A **20% RW** will apply to cash items in the process of collection.

(1) Further, counterparty risk weightings for OTC derivative transactions will not be subject to any specific ceiling.

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Detail
SA for credit risk

Regarding the recognition and implementation considerations of external ratings, the BCBS has maintained mostly the same provisions as in the Basel II framework

Recognition of external ratings and implementation considerations

Recognition and eligibility criteria

- As in the Basel II framework, only credit assessments from credit rating agencies recognised as **ECAIs will be allowed**, in jurisdictions that allow the use of external ratings for regulatory purposes.
- Regarding the **eligibility criteria**, it remains mostly unchanged from Basel II (e.g. objectivity, independence, disclosure) although the following two criterions have been included: i) **no abuse of unsolicited ratings** (i.e. ECAIs must not use unsolicited ratings to put pressure on entities to obtain solicited ratings); and ii) **cooperation with the supervisor** (i.e. ECAIs should notify the supervisor of significant changes to methodologies and provide access to external ratings and other relevant data).

Implementation considerations

- In jurisdictions that allow the use of external ratings for regulatory purposes, supervisors shall consider the following aspects:
  - **Mapping process** and **multiple external ratings** (one, two, three or more ratings). The considerations remain unchanged from the Basel II framework.
  - **Issuer versus issues assessment.** This aspect remains mostly unchanged from Basel II, as the BCBS has specified that, in circumstances where the issuer has a specific high-quality rating (one which maps into a lower RW) that only applies to a limited class of liabilities (such as a deposit assessment) this may only be used in respect of exposures that fall within that class.
  - **Domestic currency and foreign currency ratings**. It remains unchanged from Basel II framework.
  - **Short term/long term ratings**. These ratings remain unchanged from Basel II, and therefore the following RW are applied:

RW table for specific short-term ratings				
External rating[1]	A-1/P-1	A-2/P-2	A-3/P-3	Others
RW	20%	50%	100%	150%

  - **Level of application of ratings** and **use of unsolicited ratings**. These aspects remain unchanged from the Basel II framework.

(1) Methodology used by Standard & Poor's and by Moody's. The A-1 rating of Standard & Poor's includes both A-1+ and A-1–. Others category includes all non-prime and B or C ratings.

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Detail
SA for credit risk

Regarding the three CRM techniques that bank may apply to those credit risks to which are exposed, the BCBS has established overarching issues that are mostly the same as those established in Basel II

CRM techniques for exposures risk-weighted under the SA

Overarching issues

- As established in the Basel II framework, banks use a number of **techniques to mitigate the credit risks** to which they are exposed. In this regard, the framework set out above is applicable to banking book exposures that are risk-weighted under the SA for credit risk.

General and legal requirements

- In this regard, the BCBS has maintained the **same requirements as in the Basel II framework** (e.g. no transaction in which CRM techniques are used shall receive a higher capital requirement than an otherwise identical transaction where such techniques are not used; the effects of CRM must not be double-counted; and the Pillar 3 requirements must be fulfilled).

Treatment of maturity mismatches

- In the case of financial collateral, maturity mismatches **are not allowed under the simple approach**, although under the other approaches, CRM may be partially recognised by applying an adjustment:

$$P_a = P \cdot \frac{t - 0.25}{T - 0.25}$$

  - P_a = value of credit protection adjusted for maturity mismatch.
  - P = credit protection amount (e.g. collateral amount) adjusted for any haircut.
  - t = min {T, residual maturity of the credit protection arrangement expressed in years}.
  - T = min {5 years, residual maturity of the exposure expressed in years},

Currency mismatches

- In order for banks to obtain capital relief for any use of CRM techniques, **all documentation** used in collateralised transactions, on-balance sheet netting agreements, guarantees and credit derivatives **must be binding** on all parties and legally enforceable in all relevant jurisdictions.

CRM techniques

- There are three CRM techniques that banks can used to mitigate the credit risks to which they are exposed. In particular these techniques are the following:
  - **Collateralised transactions**. As in the Basel II framework, banks may opt for either the simple approach or the comprehensive approach for mitigating credit risk to these transactions.
  - **On-balance sheet netting**. The treatment is the same as in Basel II.
  - **Guarantees and credit derivatives**. As the two-mentioned CRM techniques, this technique is the same as the one established in the Basel II framework.

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Detail

IRB approach for credit risk

The BCBS has also reviewed the IRB approach for credit risk and has determined that banks must categorise their BB exposures into a broad class of assets whose definitions are mostly the same as those provided in the Basel II framework

Mechanics of the IRB approach (1/2)

Categorisation of exposures

- Under the IRB approach, banks must categorise BB exposures into broad **classes of assets** with different underlying risk characteristics, subject to the definitions set out below[1]:
  - **Corporate exposures**. The same definition as provided in the Basel II framework is applied to these exposures. Therefore, five sub-classes of specialised lending are identified: i) project finance (PF), ii) objet finance (OF), iii) commodities finance (CF), iv) income-producing real estate (IPRE), and v) high volatility commercial real estate (HVCRE) lending.
  - **Sovereign exposures**. The definition and treatment of these exposures remain unchanged from the Basel II framework.
  - **Bank exposures**. The definition of these exposures is the same as the one set out in Basel II.
  - **Retail exposures**. According to the Basel II framework, an exposure is categorised as a retail exposure considering the nature of borrower or low value of individual exposures, as well as the number (large) of exposures.
  - **QRRE**. The same criteria as established in the Basel II framework is considered although the revised definition would split the QREE sub-class into exposures to transactors and revolvers. In this regard, a QRRE transactor is an exposure to an obligor in relation to a facility such as credit card or charge card where the balance has been repaid in full at each scheduled repayment date for the previous 12 months, or the exposure is in relation to an overdraft facility if there have been no drawdowns over the previous 12 months. All exposures that are not QRRE transactors are QRRE revolvers.
  - **Equity exposures**. This asset class covers exposures to equities as defined for the SA for credit risk and the Basel II framework.
  - **Eligible purchased receivables**. The same definition as provided in the Basel II framework for either the retail and corporate receivables is considered.

(1) Despite it is not the intention of the BCBS to require banks to change the way in which they manage their business and risks, banks are required to apply the appropriate treatment to each exposure for the purposes of deriving their minimum capital requirement.

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Detail

IRB approach for credit risk

There are two types of IRB approaches: an F-IRB approach in which banks provide their own estimates of PD an rely on supervisory estimates for other risk components, and an A-IRB in which banks provide their own estimates of PD, LGD and EAD, and their own calculation of M

Mechanics of the IRB approach (2/2)

F-IRB and A-IRB approaches

- For many of the assets classes, the BCBS has made available two broad approaches as in Basel II:
  - The **F-IRB approach** in which, as a general rule, banks provide their own estimates of PD and rely on supervisory estimates for other risk components.
  - The **A-IRB approach** in which banks provide more of their own estimates of PD, LGD and EAD, and their own calculation of M, subject to meeting minimum standards. Nevertheless, this approach cannot be used for: i) exposures to general corporates belonging to a group with total consolidated annual revenues greater than €500m; and ii) exposures in the bank asset class, and other securities firms and financial institutions (including insurance companies, among others).
- For **exposures to equities**, both IRB approaches are not permitted, so **only the SA is permitted**.
- Moreover, as established in the Basel II framework, the BCBS has determined the application of the IRB approaches to the following exposures: i) **corporate and bank exposures** (F-IRB approach and A-IRB approach); ii) **retail exposures** (A-IRB approach); **equity exposures** (subject to the SA for credit risk, with the exception of certain equity investments in funds); and **eligible purchased receivables** (F-IRB and A-IRB approaches for eligible corporate receivables, and only A-IRB approach for eligible retail receivables).
- Regarding the adoption of the IRB approach, the same provisions as set out in the Basel II framework are considered. Therefore, banks adopting an IRB approach for an asset class within a particular business unit must apply the **IRB approach to all exposures** within that asset class in that unit.

Elements of IRB approaches

- For each of the asset classes covered under IRB framework, there are 3 key elements:
  - **RWA functions** (i.e. risk components transformed into RWAs and therefore to capital requirements).
  - **Risk components** (i.e. estimates of risk parameters provided by banks, some of which are supervisory estimates).
  - **Minimum requirements** (i.e. the minimum standards that must be met in order for a bank to use the IRB approach for a given asset class).

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Detail
IRB approach for credit risk

For corporate and bank exposures, the RWA function is dependent on estimates of the PD, LGD and EAD and, in some cases, effective M, for a given exposure

Rules for corporate and bank exposures (1/2)

RWA functions

- **RWA for corporate and bank exposures**. The derivation of this RWA function is dependent on estimates of the PD, LGD and EAD and, in some cases, effective M, for a given exposure. For **exposures not in default**, the formula and all relevant provisions are the same as in Basel II[1]:

$$\textbf{Correlation}\ (R) = 0.12 \cdot \frac{(1 - e^{-50 \cdot PD})}{(1 - e^{-50})} + 0.24 \cdot \left(1 - \frac{(1 - e^{-50 \cdot PD})}{(1 - e^{-50})}\right)$$

$$\textbf{Maturity adjustment}\ (b) = [0.11852 - 0.05478 \cdot In(PD)]2$$

$$\textbf{Capital requirement}(K) = \left[LGD \cdot N\left[\frac{G(PD)}{\sqrt{(1-R)}} + \sqrt{\frac{R}{1-R}} \cdot G(0.999)\right] - PD \cdot LGD\right] \cdot \frac{(1 + (M - 2.5) \cdot b)}{(1 - 1.5 \cdot b)}$$

$$\textbf{Risk} - \textbf{weighted assets}\ (RWA) = K \cdot 12.5 \cdot EAD$$

  Further, the BCBS has introduced a **multiplier of 1.25** which will be applied to the **correlation parameter** of all exposures to financial institutions meeting certain criteria:

  - Regulated financial institutions whose total assets are greater than or equal to US $100 billion.
  - Unregulated financial institutions, regardless of size.
  - $Correlation\ (R_{FI}) = 1.25 \cdot \left[0.12 \cdot \frac{(1-e^{-50 \cdot PD})}{(1-e^{-50})} + 0.24\left(1 - \frac{(1-e^{-50 \cdot PD})}{(1-e^{-50})}\right)\right]$

- Regarding the **firm-size adjustment for SME** and the provisions on **RW for specialised lending** (PF, OF, CF, IPRE, as well as HVRE) the same arrangements as in the Basel II framework are considered.

(1) Nevertheless, those provisions regarding the calculation of RWAs for exposures subject to the double default framework set out in the Basel II framework are deleted in the Basel III reform.

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Detail
IRB approach for credit risk

There are minimum floor values for corporate and bank estimated IRB parameters that are used as inputs to the calculation of RW

Rules for corporate and bank exposures (2/2)

Risk components

- For corporate and bank exposures, the risk components are the **PD**, **LGD and EAD**. In this regard, the provisions on these parameters remain mostly **unchanged from the Basel II framework**.
- However, the revised IRB framework also introduces **minimum floor values** for bank-estimated IRB parameters that are used as inputs to the calculation of RWA. In the case of an exposure that is guaranteed by a sovereign, the floors that apply to the risk components do not apply to that part of the exposure covered by the sovereign guarantee.

PD

- The **PD for each exposure** that is used as input into the RW formula and the calculation of EL must not be less than **0.05%** (this floor was fixed at 0.03% in Basel II).

LGD

- A bank must provide an estimate of the LGD for each corporate and bank exposure. There are two approaches for deriving this estimate: F-IRB and A-IRB approaches. In the latter, the following floors are applied:

	LGD	
	Unsecured	Secured
Corporate	25%	Varying by collateral type: i) 0% financial; ii)10% receivables; iii)10% commercial and residential real estate; and iv)15% other physical

EAD

- The EAD for each exposure that is used as input into the RW formula and the calculation of EL is subject to a floor that is the sum of: (i) the on **balance sheet amount**; and (ii) **50% of the off balance sheet** exposure using the applicable CCF in the standardised approach.

Effective M[1]

- As in Basel II, for banks using the **F-IRB approach** for corporate exposures, M will be 2.5 years except for repo-style transactions where the effective maturity will be 6 months, whereas for banks using any element of the **A-IRB approach** it isrequired to measure effective maturity for each facility as defined below (M is subject to, in general terms, a floor of one year and a cap of 5 years).

(1) The treatment of maturity mismatches under IRB is identical to that in the SA.

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Detail

IRB approach for credit risk

For retail exposures, there are three different RWA functions based on separate assessment of PD and LGD. These functions apply to retail residential mortgage exposures, QRRE and other retail exposures

Rules for retail exposures (1/2)

RWA functions

- For **retail exposures**, there are three RWA functions which are based on separate assessment of PD and LGD as established in the Basel II framework. However, none of the three retail RWA functions contain the full maturity adjustment component that is present in the RWA function for exposures to banks and corporates.

Retail residential mortgage exposures

- For these exposures that are not in default and are secured or partly secured by residential mortgages, **RWs will be assigned based on the following formula**:

$$Correlation\ (R) = 0.15$$

$$Capital\ requirement\ (K) = \left[LGD \cdot N\left[\frac{G(PD)}{\sqrt{(1-R)}} + \sqrt{\frac{R}{1-R}} \cdot\ G(0.999)\right] - PD \cdot LGD\right]$$

$$RWAs = K \cdot 1.25 \cdot EAD$$

Qualifying revolving retail exposures

- For these exposures that are not in default, **RWs will be assigned based on the following formula**:

$Correlation\ (R) = 0.04$

$Capital\ requirement\ (K)$ = the same formula as for retail residential mortgage exposures is applied.

$RWAs$ = the same formula as for retail residential mortgage exposures is applied.

Other retail exposures

- For these exposures that are not in default, **RWs will be assigned based on the following formula**:

$$Correlation\ (R) = 0.03 \cdot \frac{(1 - e^{-35 \cdot PD})}{(1 - e^{-35})} + 0.16 \cdot \left(1 - \frac{(1 - e^{-35 \cdot PD})}{(1 - e^{-35})}\right)$$

$Capital\ requirement\ (K)$ = the same formula as for retail residential mortgage exposures is applied.

$RWAs$ = the same formula as for retail residential mortgage exposures is applied.

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IRB approach for credit risk

The risk component that are applicable to retail exposures are the PD, LGD and the EAD. Further, banks may reflect guarantees and credit derivatives through an adjustment of either the PD or LGD estimate, subject to minimum requirements

Rules for retail exposures (2/2)

Risk components

- For retail exposures, the risk components are the **PD**, **LGD** and **EAD**. Moreover, banks may reflect the risk-reducing effects of **guarantees** and **credit derivatives**. In this regard, the provisions on these parameters remain mostly unchanged from the **Basel II framework**.

PD and LGD

- For each identified pool of retail exposures, banks are expected to provide an estimate of the **PD and LGD associated with the pool**, subject to minimum requirements.
- Additionally, the **PD is the greater of**: i) one-year PD associated with the internal borrower grade to which the pool of retail is assigned and ii) 0.1% for QRRE and 0.05% for all other exposures.
- The **LGD for each exposure** that is used as input into the RWA formula and the calculation of expected loss must not be less than the parameter floors indicated in the table below:

	LGD	
Retail classes:	Unsecured	Secured
Mortgage	N/A	5%
QRRE (transactors and revolvers)	50%	N/A
Other retail	30%	Varying by collateral type: i) 0% financial; ii) 10% receivables; iii) 10% commercial and residential real estate; and iv) 15% other physical

Guarantees and credit derivatives

- Banks may reflect them, either support of an individual obligation or a pool of exposures, through an **adjustment of either the PD or LGD estimate**, subject to minimum requirements. However, banks must not include the effect of double default in such adjustments.

EAD

- Both on and off-balance sheet retail exposures are measured gross of specific provisions or partial write-offs.
- The EAD on drawn amounts should **not be less than the sum of**: (i) the amount by which a bank's regulatory capital would be reduced if the exposure were written-off fully; and (ii) any specific provisions and partial write-offs.

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IRB approach for credit risk

For purchased receivables, there are IRB capital charges for both default risk and dilution risk as set out in Basel II. Moreover, the treatment of purchase price discount and the recognition of credit risk mitigants are also aligned with the Basel II framework

Rules for purchased receivables

RWAs for default risk

- As in the Basel II framework, for receivables belonging unambiguously to one asset class, the IRB RW for default risk is based on the **RWA function applicable to that particular exposure type**, as long as the bank can meet the qualification standards for this particular function. In this regard, it is differentiated between:
  - **Purchased retail receivables:** A bank must meet the risk quantification standards for retail exposures but can utilise external and internal reference data to estimate the PDs and LGDs, remaining unchanged from the Basel II framework.
  - **Purchase corporate receivables**: The purchasing bank is expected to apply the existing IRB risk quantification standards for the bottom-up approach remaining unchanged from the Basel II framework. However, regarding this type of receivables, the purchasing bank could apply two different treatment: a **F-IRB approach** (e.g. applying a LGD of 40% if the bank can demonstrate that the exposures are exclusively senior claims to corporate borrowers) or an **A-IRB approach** (e.g. by using an appropriate PD estimate to infer the long-run default-weighted average loss rate given default).

RWAs for dilution risk

- As in Basel II, for the purpose of calculating RWAs for dilution risk, the corporate RWA function must be used with the following settings: the **PD** must be **equal to the estimated EL**, and the **LGD must be set at 100%**.

Treatment of purchase price discount

- As provided in Basel II, in many cases, the purchase price of receivables will reflect a discount that provides first loss protection for default losses, dilution losses or both.
- To the extent that a portion of such a purchase price discount may be refunded to the seller based on the performance of the receivables, the **purchaser** may recognise this refundable amount as **first-loss protection** and hence treat this exposure under the securitisation framework, while the **seller** providing such a refundable purchase price discount must treat this amount as a **first-loss position** under that framework.

Recognition of credit risk mitigants

- As set out in the Basel II, a guarantee provided by the seller or a third party will be treated using the existing IRB rules for guarantees, regardless of whether the guarantee covers default risk, dilution risk, or both.

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Detail

IRB approach for credit risk

Regarding the treatment of EL and recognition of provisions, the BCBS has established the method by which the difference between provisions, such as portfolio-specific general provisions; and EL may be included in or must be deducted from regulatory capital

Treatment of expected losses and recognition of provisions

Calculation of EL

- A bank must sum the **EL amount** (defined as EL multiplied by EAD) associated with its exposures to which the IRB approach is applied (excluding the EL amount associated with securitisation exposures) to obtain a total EL amount. In this regard, this calculation is different for:
  - **Exposures other than exposures subject to the supervisory slotting criteria**. Banks must calculate EL as PD x LGD for corporate, bank, and retail exposures not in default.
  - **Special lending exposures subject to the supervisory slotting criteria** (non-HVRE and HVCRE). The EL amount is determined by multiplying 8% by the RWAs from the relevant RW multiplied by EAD.

RW for specialised lending, other than HVCRE				
Strong	Good	Satisfactory	Weak	Default
5%	10%	35%	100%	625%

RW for HVCRE				
Strong	Good	Satisfactory	Weak	Default
5%	5%	35%	100%	625%

Calculation of provisions

- **Exposures subject to the IRB approach**. Total eligible provisions are defined as the sum of all provisions (e.g. specific provisions, partial write-offs) that are attributed to exposures treated under the IRB approach.
- **Portion of exposures subject to the SA for credit risk**. Banks must determine provisions according to two methods: i) banks should generally attribute total general provisions on a pro rata basis according to the portion of credit RWAs subject to the SA and IRB approaches; ii) at national supervisory discretion, banks using both the SA and IRB approaches may rely on their internal methods for allocating general provisions for recognition in capital under either the SA or IRB approach, subject to certain conditions[1].

Treatment of EL and provisions

- Banks using the IRB approach must compare the **total amount of total eligible provisions** with the **total EL amount** as calculated within the IRB approach.
- Where the calculated **EL amount is lower than the total eligible provisions** of the bank, its supervisors must consider whether the EL fully reflects the conditions in the market in which it operates before allowing the difference to be included in Tier 2. If specific provisions exceed the EL amount on defaulted assets this assessment needs to be made before using the difference to offset the EL amount on non-defaulted assets.

(1) Where the internal allocation method is made available, the national supervisor will establish the standards surrounding their use.

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Detail

IRB approach for credit risk

The minimum requirements for entry and on-going use of the IRB approach are related to: i) composition of minimum requirements; ii) compliance; liii) rating system design, including rating dimensions…

Minimum requirements for IRB approach (1/11)

Composition of minimum requirements

- To be eligible for the IRB approach a bank must demonstrate to its supervisor that it meets certain **minimum requirements** at the outset and on an ongoing basis (e.g. rating and risk estimation systems and processes provide for a meaningful assessment of borrower and transaction characteristics; a differentiation of risk).
- The requirements apply to **all assets classes** and to the **F-IRB and A-IRB approaches**, unless specified.

Compliance

- Banks should meet the **IRB requirements** provided. Where a bank is **not in complete compliance** with all the minimum requirements, it must produce a plan for a timely return to compliance, and seek approval from its supervisor, or demonstrate that the effect of such non-compliance is immaterial (in terms of risk).

Rating system design[1]

- Within each asset class, a bank may utilise **multiple rating methodologies/systems**. If a bank chooses to use multiple systems, the rationale for assigning a borrower to a rating system must be documented and applied in a manner that best reflects the level of risk of the borrower.

Rating dimensions

- **Standards for corporate and bank exposures**. A qualifying IRB rating system must have two separate and distinct dimensions:
  - Risk of borrower default. Separate exposures to the same borrower must be assigned to the same borrower grade, irrespective of any difference in the nature of each specific transaction[1].
  - Transaction-specific factors. For exposures subject to the F-IRB approach, this requirement can be fulfilled by the existence of a facility dimension, reflecting borrower and transaction-specific factors.
- **Standards for retail exposures**. Rating systems for these exposures must be oriented to both borrower and transaction risk, and must capture all relevant borrower and transaction characteristics. Banks must assign each exposure into a particular pool. At a minimum, banks should consider borrower and transaction risk characteristics and delinquency of exposure when assigning exposures to a pool.

(1) The term "rating system" comprises all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates.

(2) There are two exception, one in the case of country transfer risk and other when the treatment of associated guarantees to a facility may be reflected in an adjusted borrower grade.

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Detail
IRB approach for credit risk

…rating structure, rating criteria, and rating assignment horizon…

Minimum requirements for IRB approach (2/11)

Rating structure

- **Standards for corporate and bank exposures**. A bank must have a meaningful distribution of exposures across grades with no excessive concentrations, on both its borrower-rating and its facility-rating scales. To this end, a banks must have a minimum of seven borrowers grades[1] for non-defaulted borrowers (although banks using the supervisory slotting criteria must have at least four grades for non-defaulted borrowers) and one for those that have defaulted.
- **Standards for retail exposures**. For each pool identify, the bank must be able to provide quantitative measures of loss characteristics (PD, LGD and EAD) for that pool. There must be a meaningful distribution of borrowers and exposures across pools.

Rating criteria

- A bank must have **specific rating definitions**, **processes and criteria** for assigning exposure to grades within rating system. The rating definition and criteria must be both plausible and intuitive and must result in a meaningful differentiation of risk.
- Furthermore, banks using the **supervisory slotting criteria** must assign exposures to their internal rating grades based on their own criteria, system and processes subject to compliance with the requisite minimum requirements. Banks must then map these internal rating grades into the 5 supervisory rating categories.

Rating assignment horizon

- Although the time horizon used in PD estimation is one year, banks are expected to use a **longer time horizon** in assigning ratings.
- A borrower rating must represent the bank's assessment of the **borrower's ability and willingness to contractually perform** despite adverse economic conditions or the occurrence of unexpected events. Rating systems should be designed in such a way that idiosyncratic or industry-specific changes are a driver of migrations from one category to another, and business cycle effects may also be a driver.
- PD estimates for highly leveraged borrowers or for borrowers whose assets are predominately traded assets must reflect the performance of the underlying assets based in periods of **stresses volatilities**.
- Given the difficulties in forecasting, banks must take a **conservative view** of projected information,

(1) Borrower grade is defined as an assessment of borrower risk on the basis of a specific and distinct set of rating criteria, from which estimates of PD are derived.

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Detail
IRB approach for credit risk

…use of models and documentation of rating system design…

Minimum requirements for IRB approach (3/11)

Use of models

- These requirements apply to **statistical models** and **other mechanical methods** used to assign borrower and facility ratings or in estimation of PDs, LGDs, or EADs
- **Credit scoring models** and **other mechanical procedures** are permissible as the primary or partial basis of rating assignments, and may play a role in the estimation of loss characteristics. Sufficient human judgement and oversight is necessary to ensure that all material information, including that which is outside the scope of the model, is also taken into consideration, and that the model is used appropriately.
  - The **burden is on the bank** to satisfy its supervisor that a model or procedure has good predictive power and that regulatory capital requirements will not be distorted as a result of its use.
  - The banks must have in place a **process for vetting data inputs** into statistical default or loss prediction model (including an assessment of the accuracy, completeness, etc.).
  - Demonstrate that the data used to build the model are **representative of the population** of the bank's actual borrowers or facilities.
  - When combining model results with human judgement, the judgement must take intro account all **relevant and material information** not considered by the model.
  - The bank must have procedures for **human review of model-based rating assignments**.
  - The bank must have a **regular cycle of model validation** that includes monitoring of model performance and stability; review of model relationships; and testing of model outputs against outcomes.

Documentation of rating system design

- Banks must document in writing their **rating system' design** and **operational details**. The documentation must evidence banks' compliance with the minimum standards and must address topics (e.g. portfolio differentiation, rating criteria, etc.).
- If the banks employs statistical models in the rating process, the bank must document their methodologies (by provide a detailed outline of the theory, assumptions and/or mathematical and empirical basis of the assignment of estimates to grades, individual obligors, etc.).

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Detail
IRB approach for credit risk

…iv) risk rating system operation, including coverage of ratings, integrity of rating process, overrides, data maintenance and stress testing…

Minimum requirements for IRB approach (4/11)

Risk rating system operation

- In this regard, the BCBS provides information regarding: i) the coverage of ratings, ii) the integrity of rating process, iii) overrides, iv) data maintenance, and v) stress testing.

Coverage of ratings

- For **corporate and bank exposures**, each borrower and all recognised guarantors must be assigned a rating and each exposure must be associated with a facility rating as part of the loan approval process. Similarly, for **retail**, each exposure must be assigned to a pool as part of the loan approval process.

Integrity of rating process

- **Standards for corporate and bank exposures**. Rating assignments and periodic rating reviews (annually) must be completed approved by a party that does not directly stand to benefit from the extension of credit.
- **Standards for retail exposures**. A bank must review the loss characteristics and delinquency status of each identified risk pool on at least an annual basis and the status of the individual borrowers.

Overrides

- For **rating assignments** based in expert judgements, banks must clearly articulate the situations in which banks officers may override the outputs of the rating process.
- For **model-based ratings**, banks must have guidelines and processes for monitoring when human judgement has overridden the model's rating, variables were excluded or inputs were altered.

Data maintenance

- For **corporate and bank exposures**, banks must maintain rating histories on borrowers and recognised guarantors (including the rating since the borrower/guarantor was assigned an internal grade, etc.).
- For **retail exposures**, banks must retain data used in the process of allocating exposures to pools, including data on borrowers and transaction risk characteristics used, estimated PDs, LGDs and EADs, etc.

Stress testing

- An IRB bank must have sound stress testing processes for use in the assessment of **capital adequacy**. Stress testing must involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a bank's credit exposures and assessment of the bank's ability to withstand such changes. Examples of scenarios are (i) economic or industry downturns; (ii) market-risk events; and (iii) liquidity conditions.

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Detail
IRB approach for credit risk

…v) corporate governance and oversight, including coverage of ratings, credit risk control, and internal and external audit; vi) use of internal ratings

Minimum requirements for IRB approach (5/11)

Corporate governance and oversight

- The corporate governance must control the rating and estimation processes, there is also a credit risk control apart from the internal and external audit.

Corporate governance

- All material aspects of the rating and estimation processes must be **approved by bank's Board of Directors** or a designated committee thereof and senior management which must possess a general understanding of the bank's risk rating system and detailed comprehension of its associated management reports (which include risk profile by grade, migration across grades, etc.).
- **Senior management** must provide notice to the Board of Directors of material changes or exceptions from established policies that will materially impact the operations of the bank's rating system..

Credit risk control

- Banks must have **independent credit risk controls units** that are responsible for the design or selection, implementation and performance of their internal rating system. Their areas of responsibility must include test and monitoring internal grades; production and analysis of summary reports; etc.
- These units must **actively participate** in the development, selection, implementation and validation of rating models, assuming oversight and supervision responsibilities.

Internal and external audit

- Internal audit or an equally independent function must **review at least annually** the bank's rating system and its operations (including the operations of the credit function and the estimation of PDs, LGDs and EADs), and document its findings.

Use of internal ratings

- **Internal ratings** and **default and loss estimates** must play and essential role in the credit approval, risk managements, internal capital allocations, and corporate governance functions. Ratings systems and estimates designed and implemented exclusively to provide IRB inputs are not acceptable.
- A banks must have a **credible track record** in the use of internal ratings information. Thus, the bank must demonstrate that it has been using rating system that was broadly in line with the minimum requirements for at least the three years prior to qualification.

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Detail
IRB approach for credit risk

…vii) risk quantification, including overall requirements for estimation, definition of default, re-ageing, treatment of overdraft…

Minimum requirements for IRB approach (6/11)

Risk quantification

- In this regard, the BCBS provides information regarding: i) overall requirements for estimation, ii) definition of default, iii) re-ageing, iv) treatment of overdrafts, v) definition of loss for all assets classes, vi) requirements specific to PD, vii) to own-LGD, viii) to own-EAD, and ix) guarantees and credit derivatives.

Overall requirements for estimation

- **Internal estimates of PD, LGD and EAD** must incorporate all relevant, material and available data, information and methods. Further, banks must review their estimates on a **yearly basis**.
- In order to avoid over-optimism, a bank must add to its estimates a **margin of conservatism** that is related to the likely range of errors.

Definition of default

- The default is considered to have occurred with regard to a particular obligor when:
  - The bank considers that **the obligor is unlikely to pay** its credit obligations to the banking group in full, without recourse by the bank to actions such as realising security.
  - The obligor is **past due more than 90 days** on any material credit obligation to the banking group.
- Some **indications of unlikeliness to pay** are, among others, that the bank puts the credit obligation on non-accrued status or it sells the credit obligation at a material credit-related economic loss.
- If the banks considered that a previously defaulted exposure's status is such that no trigger of the reference definition, it must rate the borrower and estimate LGD as they would for a non-defaulted facility.

Re-ageing

- The bank must have **clearly articulated** and **documented policies** in respect with the counting of day past due (including the re-ageing of the facilities and the granting of extensions, deferrals, renewals and rewrites to existing accounts). The re-ageing policy must include: i) approval authorities and reporting requirements; ii) minimum age of facility before it is eligible for re-ageing; iii) delinquency levels of facilities eligible for re-ageing; iv) minimum number of re-ageing per facility; and vi) reassessment of borrower's capacity to repay.

Treatment of overdrafts

- **Authorised overdraft** must be subject to a credit limit set by the bank and brought to the knowledge of the client. Any break of this limit must be monitored.
- **Non-authorised overdrafts** will be associated with zero limit for IRB purposes.

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Detail
IRB approach for credit risk

…definition of loss for all assets classes, requirements specific to PD estimation, requirements specific to own-LGD estimates,…

Minimum requirements for IRB approach (7/11)

Definition of loss for all assets classes

- The definition of loss used in estimating LGD is **economic loss**, in which all relevant factors should be taken into account. This must include material discount effects and material direct and indirect costs associated with collecting on the exposure.

Requirements specific to PD estimation

- **Corporate and bank exposures**. Banks must use information and techniques that take appropriate account of the long-run experience when estimating the average PD for each rating grade. Banks may use any of the techniques: internal default experience, mapping to external data, and statistical default models.
- **Retail exposures**. Banks must regard internal data as the primary source of information for estimating loss characteristics, but they are permitted to use external data or statistical models. One method for deriving long-run average estimates of PD and default-weighted average LGD for retail would be based on an estimate of the expected long-run loss rate. The length of the underlying historical observation period used must be at least five years and the PD should be based on the observed historical average one-year default rate.

Requirements specific to own-LGD estimates

- **Standards for all assets classes**. A bank must estimate an LGD for each facility that aims to reflect economic downturn conditions where necessary to capture the relevant risks. This LGD cannot be less than the long-run default-weighted average loss rate given default calculated based on the average economic loss of all observed defaults within the data source for that type of facility. Moreover, LGD estimates must be grounded in historical recovery rates and, when applicable, must not solely be based on the collateral's estimated market value[1].
- **Additional standards for corporate exposures**. Estimates of LGD must be based on a minimum data observation period that should cover al least one complete economic cycle but must in any case be no shorter than a period of seven years for at least one source.
- **Additional standards for retail exposures**. The minimum data observation period for LGD estimates for retail exposure is five years. The less data a bank has, the more conservative it must be in its estimation.

(1) In addition, a bank must take into account the potential for the LGD of the facility to be higher than the default-weighted average during a period when credit losses are substantially higher than average.

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Detail
IRB approach for credit risk

…requirements specific to own-EAD estimates, guarantees and credit derivative…

Minimum requirements for IRB approach (8/11)

Requirements specific to own-EAD estimates

- **Standards for all asset classes**. It is established that, among others:
  - For on-balance sheet items, banks must estimate EAD at no less than the current drawn amount, subject to recognising the effects of on-balance sheet netting as specified in the foundation approach.
  - For off-balance sheet items, banks using the A-IRB approach must have established procedures in place for the estimation of EAD.
  - Under the A-IRB approach, banks must assign an estimate of **EAD for each eligible facility**. It must be an estimate of the long-run default-weighted average EAD for similar facilities and borrowers over a sufficiently long period of time, but with a margin of conservatism appropriate to the likely range of errors in the estimate.
  - The criteria by which estimates of EAD are derived must be plausible and intuitive, and represent what the bank believes to be the material drivers of EAD and should be based on appropriately homogenous segments.
- **Additional standards for corporate exposures**. Estimates of EAD must be based on a time period that must cover a complete economic cycle but must in any case be no shorter that a period of seven years.
- **Additional standards for retail exposures**. The minimum data observation period for EAD estimates for retail exposures is five years. The less data a bank has, the more conservative it must be in its estimation.

Guarantees and credit derivatives

- **Standards for corporate exposures where own estimates of LGD are used and standards for retail exposures.** In this regard, the standards cover:
  - **Guarantees**. When banks uses its own estimates of LG, it may reflect the risk-mitigating effect of guarantees through and adjustment to PD or LGD estimates[1]. For retail exposures, where guarantees exist, either in support of an individual obligation or a pool of exposures, a bank may reflect the risk-reducing effect either through its estimates of PD or LGD, provided this is done consistently. In adopting one or the other technique, a bank must adopt a consistent approach, both across types of guarantees and over time.

(1) The option to adjust LGD is available only to those banks that have been approved to use their own internal estimates of LGD.

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Detail
IRB approach for credit risk

…as well as requirements specific to estimating PD and LGD (or EL) for qualifying purchased receivables…

Minimum requirements for IRB approach (9/11)

Guarantees and credit derivatives (cont.)

- **Eligible guarantors and guarantees**. There are no restrictions on the types of eligible guarantors. The bank must, however, have clearly specified criteria for the types of guarantors it will recognise for regulatory capital purposes. The guarantee must be evidenced in writing, non-cancellable on the part of the guarantor, in force until the debt is satisfied in full.
- **Adjustment criteria**. A bank must have clearly specified criteria for adjusting borrower grades or LGD estimates to reflect the impact of guarantees for regulatory capital purposes. The criteria must be plausible and intuitive, and must address the guarantor's ability and willingness to perform.
- **Credit derivatives**. The minimum requirements for guarantees are relevant also for single-name credit derivatives, although additional considerations arise regarding asset mismatches (e.g. the asset on which the protection is based cannot be different from the underlying asset),

- **Banks using foundation LGD estimates**. The above-mentioned minimum requirement apply except when: i) the bank not able to use an 'LGD-adjustment' option; and ii) the range of eligible guarantees and guarantors is limited to those regarding the recognition under the foundation approach.

Requirements specific to PD/ LGD estimates (or EL)[1]

- **Minimum operational requirements**. A bank purchasing receivables has to justify confidence that current and future advances can be repaid from the liquidation of the receivables pool. To qualify for the top-down treatment of default risk, the receivable pool and overall lending relationship should be closely monitored and controlled. Specifically, a bank will have to demonstrate the following:
  - **Legal certainty** (i.e. the bank have effective ownership and control of the cash remittances from the receivables, including incidences of seller or servicer distress and bankruptcy).
  - **Effective monitoring system** (i.e. the bank must be able to monitor both the quality of the receivables and the financial condition of the seller and servicer).
  - **Effective work-out systems** (i.e. the bank must address emerging problems pro-actively).
  - **Effective systems controlling collateral, credit availability and cash**. (i.e. the bank must have clear and effective policies and procedures governing the control of receivables, credit, and cash).
  - **Compliance with the bank's internal policies and procedures**.

(1) These minimum requirements must be satisfied for any purchased receivables (corporate or retail) making use of the top-down treatment of default risk and/or the IRB treatments of dilution risk.

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Detail
IRB approach for credit risk

…viii) validation of internal estimates;
ix) supervisory LGD and EAD estimates…

Minimum requirements for IRB approach (10/11)

Validation of internal estimates

- Banks must have a robust system in place to validate the **accuracy and consistency** of rating systems, processes, and the estimation of relevant risk components.
- Banks must **regularly compare** realised default rates with estimated PDs for each grade and be able to demonstrate that the realised default rates are within the expected range for that grade. Banks using the A-IRB approach must complete such analysis to their estimates of LGDs and EADs.
- Among other aspects, banks must also use **other quantitative validation tools** and comparisons with relevant external data sources, they should demonstrate that quantitative testing methods and other validation methods **do not vary systematically** with the economic cycle, etc.

Supervisory LGD and EAD estimates

- Banks under the **F-IRB approach**, which do not meet the requirements for own-estimates of LGD and EAD, above, must meet the minimum requirements described in the SA to receive recognition for eligible financial collateral. They must meet the following additional minimum requirements:
  - **Definition of eligibility of CRE and RRE as collateral** where the risk of the borrower is not materially dependent upon the performance of the underlying property or project, but rather on the underlying capacity of the borrower to repay the debt from other sources, and the value of the collateral pledged must not be materially dependent on the performance of the borrower.
  - **Operational requirements for eligible CRE/RRE** which include: i) legal enforceability; ii) objective market value of collateral; iii) frequent revaluation (i.e. minimum once a year) and iv) junior liens. Moreover there are additional collateral management requirements (e.g. banks must monitor on an ongoing basis the extent of any permissible prior claim on the property).
  - **Requirements for recognition of financial receivables** which include the definition of eligible receivables (i.e. claims with an original maturity of less than or equal to one year where repayment will occur through the commercial or financial flows related to the underlying assets of the borrower), certain operational requirements (i.e. legal certainty and risk management), and requirements for recognition of other physical collateral (e.g. The bank demonstrates to the satisfaction of the supervisor that there are liquid markets for disposal of collateral in an expeditious and economically efficient manner).

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Detail
IRB approach for credit risk

…x) requirements for recognition of leasing; as well as xi) disclosure requirements

Minimum requirements for IRB approach (11/11)

Requirements for recognition of leasing

- Leases other than those that expose the bank to residual value risk will be accorded the **same treatment as exposures collateralised** by the same type of collateral. The minimum requirements for the collateral type must be met (CRE/RRE or other collateral).
- In addition, banks must also meet the following standards:
  - **Robust risk management** on the part of the lessor with respect to the location of the asset, the use to which it is put, its age, and planned obsolescence.
  - A **robust legal framework** establishing the lessor's legal ownership of the asset and its ability to exercise its rights as owner in a timely fashion.
  - The difference between the rate of depreciation of the physical asset and the rate of amortisation of the lease payments must **not be so large** as to overstate the CRM attributed to the leased assets.
- Leases that expose the bank to **residual value risk** will be treated in the following manner. Residual value risk is the bank's exposure to potential loss due to the fair value of the equipment declining below its residual estimate at lease inception.
  - The discounted lease payment stream will receive a risk weight appropriate for the lessee's financial strength (PD) and supervisory or own-estimate of LGD, whichever is appropriate.
  - The residual value will be risk-weighted at 100%.

Disclosure requirements

- In order to be eligible for the IRB approach, banks must meet the disclosure requirements set out in **Pillar 3**.
- These are minimum requirements for use IRB: failure to meet Pillar 3 requirements will render banks **ineligible to use** the relevant **IRB approach**.

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Detail
CVA risk framework

The BCBS has also reviewed the CVA framework by considering only two available approaches for calculating the CVA capital, the SA-CVA and the BA-CVA

General provisions

General provisions for CVA

- Regarding the CVA framework, it stands for credit valuation adjustment specified at a counterparty level and reflects the **adjustment of default risk-free prices of derivatives** and **SFTs** due to a potential default of the counterparty.
- The capital requirements for CVA risk must be calculated by all banks involved in **covered transactions** (including all derivatives except those transacted directly with a qualified central counterparty)[1]. Furthermore, these requirements are calculated for **bank's CVA portfolio**, which includes CVA for a bank's entire portfolio of covered transactions and eligible CVA hedges, on a standalone basis.
- Two approaches are available for calculating CVA capital:
  - The **SA-CVA**, that requires supervisory approval for using it. In this regard, banks that have received the approval to use the SA-CVA may carve out from the SA-CVA calculations any number of netting sets. CVA capital for all carved out netting sets must be calculated via the BA-CVA.
  - The **BA-CVA**, which must be use by banks unless they receive approval from their relevant supervisory authority to use the SA-CVA.
- A **materiality threshold** is established (i.e. any bank whose aggregate notional amount of non-centrally cleared derivatives is less than or equal to €100 bn is deemed as being below the materiality threshold). Any bank below this threshold may choose to set its CVA capital equal to 100% of its capital requirement for CCR.
- CVA hedging instruments can be **external** (i.e. with an external counterparty) or **internal** (i.e. with one of the bank's trading desks).
  - **All external CVA hedges** (whether eligible or not) that are covered transactions must be included in the CVA calculation for the counterparty to the hedge.
  - **An internal CVA hedge** involves two perfectly offsetting positions: one of the CVA desk and the opposite position of the trading desk.
- Banks that use the BA-CVA or the SA-CVA for calculating CVA capital requirements may **cap the maturity adjustment factor at 1** for all netting sets contributing to CVA capital when they calculate CCR capital under the IRB approach.

(1) These transactions also include SFTs that are fair-valued by a bank for accounting purposes.

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Detail
CVA risk framework

Regarding the BA-CVA, banks should calculate the CVA capital either via a full or a reduced version. The latter version is obtained from the full version through the elimination of hedging recognition

BA-CVA (1/2)

General provisions for BA-CVA

- The BA-CVA calculations may be performed either via:
  - The **full version**, which recognises counterparty spread hedges and is for banks that hedge CVA risk.
  - The **reduced version**, which is obtained from the full version via elimination of hedging recognition.
- Any bank under the **BA-CVA approach** can choose whether to implement the full or reduced versions.

Reduced version of the BA-CVA

- This version is designed to simplify BA-CVA implementation for **less sophisticated banks** that do not hedge CVA. The reduced BA-CVA is also part of the full BA-CVA capital calculations as a conservative means to restrict hedging efficiency, so all banks using the BA-CVA must make these calculations.
- The **capital requirement for CVA risk** under the reduced version of the BA-CVA ($K_{reduced}$) is calculated:

$$K_{reduced} = \sqrt{\left(\rho \cdot \sum_c SCVA_c\right)^2 + (1-\rho^2) \cdot \sum_c SCVA_c^2}$$

Where:
- $SCVA_c$ = CVA capital requirement of counterparty c.
- ρ = 50%. It is the supervisory correlation parameter.

- The **stand-alone $SCVA_c$** is calculated as follows:

$$SCVA_c = \frac{1}{\alpha} \cdot RW_c \cdot \sum_{NS} M_{NS} \cdot EAD_{NS} \cdot DF_{NS}$$

Where:
- RW_c = is the RW for counterparty c that reflects the volatility of its credit spread.
- M_{NS} = is the effective maturity for the netting set NS.
- EAD_{NS} = is the EAD of the netting set NS, calculated in the same way as the calculation of minimum capital requirements for CCR.
- DF_{NS} = is a supervisory discount factor.
- α = 1.4

- The **RW_c are provided by the BCBS**, specified as either investment grade, high yield or not rated (e.g. for sovereigns including central banks and MDBs the RW are 0.5%, and 3.0%, respectively).

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Detail
CVA risk framework

The full version for calculating CVA capital is for banks that hedge CVA risks. In this regard, eligible hedges are those transactions used for mitigating the counterparty credit spread component of CVA risk

BA-CVA (2/2)

Full version of the BA-CVA

- This version is for banks that hedge CVA risk. In this regard, the eligible hedges are only those **transactions** used for mitigating the counterparty credit spread component of CVA risk, and managed as such.
- Only single-name CDS, single-name contingent CDS and index CDS can be **eligible CVA hedges**.
- **Eligible single-name credit instruments** must: (i) reference the counterparty directly; (ii) reference an entity legally related to the counterparty; or (iii) reference an entity that belongs to the same sector and region as the counterparty.

Calculations

- Banks that intend to use the full version of BA-CVA must calculate $K_{reduced}$ as well. Under the full version, **capital requirement for CVA risk** K_{full} is calculated as follows:

$$K_{full} = \beta \cdot K_{reduced} + (1 - \beta) \cdot K_{hedged}$$

Where:

$$K_{hedged} = \sqrt{\left(\rho \cdot \sum_c (SCVA_C - SNH_c) - IH\right)^2 + (1 - \rho^2) \sum_c (SCVA_c - SNH_c)^2 + \sum_c HMA_c}$$

$$SNH_c = \sum_{h \in c} r_{hc} \cdot RW_h \cdot M_h^{SN} \cdot B_h^{SN} \cdot DF_h^{SN}$$

$$IH = \sum_i RW_i \cdot M_i^{ind} \cdot B_i^{ind} \cdot DF_i^{ind}$$

$$HMA_c = \sum_{h \in c} \left(1 - r_{hc}^2\right) \cdot \left(RW_h \cdot M_h^{SN} \cdot B_h^{SN} \cdot DF_h^{SN}\right)^2$$

- The supervisory prescribed **correlations** r_{hc} between the credit spread of counterparty *c* and the credit spread of its single-name hedge *h* are set as follows:

Single-name hedge *h* of counterparty *c*	Value of r_{hc}
References counterparty *c* directly	100%
Has legal relation with counterparty *c*	80%
Shares sector and region with counterparty *c*	50%

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Detail

CVA risk framework

Regarding the SA-CVA, banks should consider that this approach is an adaptation of the standardised approach for market risk as well as certain aspects related to the regulatory CVA calculations, the eligible hedges…

SA-CVA (1/8)

General provisions for SA-CVA

- The SA-CVA is an **adaptation of the standardised approach for market risk** (SA-TB) under the revised market risk standard[1]. The SA-CVA must be calculated and reported to supervisors at the same monthly frequency as the SA-TB.
- The minimum **criteria for the SA-CVA eligibility** include the following: i) a bank must be able to model exposure and calculate, on at least a monthly basis, CVA and CVA sensitivities to the market risk factors; and ii) a bank must have a CVA desk responsible for risk management and hedging of CVA.

Regulatory CVA calculations

- Regulatory CVA is the **base for the calculation of the CVA risk capital requirement** under the SA-CVA. Calculations of regulatory CVA must be performed for each counterparty with which a bank has at least one covered position, according to certain principles (e.g. the calculation should assume that the bank itself is default-risk free).
- The paths of **discounted exposure** are obtained via exposure models used by a bank for calculating front office/accounting CVA, adjusted (if needed) to meet the requirements imposed for regulatory CVA calculation. Model calibration process (with the exception of the MPoR), market and transaction data used for regulatory CVA calculation must be the same as the ones used for accounting CVA calculation.
- **Netting recognition** is the same as in the accounting CVA calculations. In particular, netting uncertainty can be modelled.
- The requirements for illiquid positions, which are accounted for at fair value in the revised market risk framework extend to accounting-based CVA calculations. In particular, all components of accounting-based exposure models must be **independently validated**.

Eligible hedges

- Only whole **transactions** used for mitigating CVA risk, and managed as such, can be eligible hedges.
- Hedges of both the counterparty credit spread and exposure components of CVA risk can be eligible. Instruments that cannot be included in the Internal Model Approach for market risk under the revised market risk standard (e.g. tranched credit derivatives) **cannot be eligible CVA hedges**.

(1) The SA-CVA uses as inputs the sensitivities of regulatory CVA to counterparty credit spreads and market risk factors driving covered transactions' values.

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Detail
CVA risk framework

...the multiplier to compensate the higher level of model risk in calculations of CVA sensitivities, the calculations of SA-CVA capital requirements for delta and vega risks,…

SA-CVA (2/8)

Multiplier

- To compensate for a higher level of model risk in calculation of CVA sensitivities in comparison to sensitivities of market value of TB instruments, the equivalent measure of the revised market risk standard is scaled up via a **multiplier m_{CVA}**, with a default value of **1.25**. However, this it be increased by the supervisory authority.

Calculation of the capital requirement

- The **SA-CVA capital requirement** is calculated as the sum of the capital requirements for delta and vega risks calculated for the entire CVA portfolio (including eligible hedges):
  - The **capital requirement for delta risk** is the simple sum of delta capital requirements calculated independently for the following six risk types: i) interest rate; ii) FX; iii) counterparty credit spreads; iv) reference credit spreads (i.e. credit spreads that drive exposure); v) equity; and vi) commodity[1].
  - The **capital requirement for vega risk** is calculated as the simple sum of vega capital requirements calculated independently for the following five risk types: i) interest rates; ii) FX; iii) reference credit spreads; iv) equity; and v) commodity.
- Delta and vega capital requirements are calculated via the **same procedure**:
  - First, for a given risk type, calculate the sensitivity of the aggregate CVA, s_k^{CVA}, and the sensitivity of the market value of all eligible hedging instruments in the CVA portfolio, s_k^{Hdg}, to each risk factor k.
  - Second, obtain the weighted sensitivities WS_k^{CVA} and WS_k^{Hdg}. The sum of both, result in the net weighted sensitivity of the CVA portfolio s_k:

2

$$WS_k^{CVA} = RW_k \cdot s_k^{CVA}$$

$$WS_k^{Hdg} = RW_k \cdot s_k^{Hdg}$$

$$WS_k = WS_k^{CVA} + WS_k^{Hdg}$$

  - Third, aggregate weighted sensitivities into a capital charge k_b within each bucket b.

3

$$K_b = \sqrt{\left[\sum_{k\in b} WS_k^2 + \sum_{k\in b}\sum_{l\in b; l\neq k} \rho_{kl} \cdot WS_k \cdot WS_l\right] + R \cdot \sum_{k\in b}\left[\left(WS_k^{Hdg}\right)^2\right]}$$

  - Fourth, aggregate bucket-level capital charges across buckets within each risk type.

4

$$K = m_{CVA} \cdot \sqrt{\sum_b K_b^2 + \sum_b \sum_{c\neq b} \gamma_{bc} \cdot K_b \cdot K_c}$$

(1) Regarding delta risk, instruments cannot be split between the two risk types.

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Detail
CVA risk framework

…as well as the buckets, risk factors, sensitivities, RW and correlations for a set of risk types including interest rates, FX, counterparty credit spread, reference credit spread, equity and commodities

SA-CVA (3/8)

Buckets, risk factors, sensitiv., RW and correlations

- For **each risk type** (i.e. interest rates, FX, counterparty credit spread, reference credit spread, and commodity), the BCBS has determined the buckets, risk factors, RWs and correlations. In this regard, the RWs and correlations match the ones in the SA-TB, except for interest rate cross-tenor correlations[1].

Interest rates[2]

- **Delta risk factors** (for a bank's domestic currency and for the following currencies: USD, EUR, GBP, AUD, CAD, SEK or JPY) are the absolute changes of the inflation rate and of the risk-free yields for the following five tenors: 1 year, 2 years, 5 years, 10 years and 30 years.
  - **Sensitivities** to the abovementioned yields are measured by changing the risk-free yield in a given currency by 1 basis point (0.0001 in absolute terms) and dividing the resulting change in the aggregate CVA (or the value of CVA hedges) by 0.0001.
  - $\boldsymbol{RW_k}$ are given by:

Risk factor	1 year	2 years	5 years	10 years	30 years	Inflation
RW	1.59%	1.33%	1.06%	1.06%	1.06%	1.59%

  - **Correlations $\boldsymbol{\rho_{kl}}$** between pairs of risk factors are**:**

	1 year	2 years	5 years	10 years	30 years	Inflation
1 year	100%	91%	72%	55%	31%	40%
2 years		100%	87%	72%	45%	40%
5 years			100%	91%	68%	40%
10 years				100%	83%	40%
30 years					100%	40%
Inflation						100%

- The risk factors, sensitivities, RWs and correlations for delta and vega risks for other currencies are different.

(1) The numbers in the tables are subject to change if calibration of the SA-TB changes.
(2) For interest rate delta and vega risks, buckets are individual currencies, and cross-bucket correlation is γ_{bc}=0.5 for all currency pair.

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Detail
CVA risk framework

For FX, delta and vega risks are calculated considering that the buckets are individual currencies, the cross-bucket correlation is equal to 0.6 and the specific delta and vega risk factors

SA-CVA (4/8)

FX

- **Buckets for delta and vega risks** are individual currencies except for a bank's domestic currency.
- **Cross-bucket correlations** γ_{bc} for delta and vega risks is equal to 0.6 for all currency pairs.
- **FX delta risk factors** for any foreign currency:
  - The single FX delta risk factor is the relative change of the FX spot rate between a given foreign currency and a bank's domestic currency (i.e. only foreign-domestic exchange rates are risk factors).
  - Sensitivities to the FX spot rate are measured by shifting a given foreign-domestic exchange rate by 1% relative to its current value and dividing the resulting change in the aggregate CVA (or the value of CVA hedges) by 0.01. All foreign-foreign rates involving the currency of the shifted foreign-domestic rate are shifted accordingly via the representation of the foreign-foreign rate as the ratio of two foreign-domestic rates (for example, if EUR is the domestic currency and USDEUR is shifted, the shifted value of USDGBP is obtained as the ratio of the shifted value of USDEUR to the unshifted value of GBPEUR).
  - RW for all foreign-domestic exchange rates are set at RW_K= 21%.
- **FX vega risk factors** for any foreign currency:
  - The single FX vega risk factor is a simultaneous relative change of all volatilities for a given foreign-domestic exchange rate.
  - Sensitivities to the FX volatilities are measured by simultaneously shifting all volatilities for a given foreign-domestic exchange rate by 1% relative to their current values and dividing the resulting change in the aggregate CVA (or the value of CVA hedges) by 0.01. Volatilities of all foreign-foreign exchange rates involving the shifted currency are shifted according to the representation of the foreign-foreign exchange rate volatility via two foreign-domestic exchange rate volatilities and the relevant implied correlation (the latter is assumed to be fixed).
  - RW for FX volatilities are set to $RW_k = RW_\sigma \cdot \sqrt{4}$, where RW_σ is set at 55%.

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Detail

CVA risk framework

For counterparty credit spread, vega risk is not calculated. Therefore, for calculating delta risk banks should consider the buckets, the cross-bucket correlations, the risk factors and the correlations provided by the BCBS

SA-CVA (5/8)

Counterparty credit spread

- For counterparty credit spread, **vega risk is not calculated**.
- **Buckets for delta risk** are:

Bucket no.	Sector
1	a) Sovereigns including central banks, multilateral development banks b) Local government, government-backed non-financials, education and public administration
2	Financials including government-backed financials
3	Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying
4	Consumer goods and services, transportation and storage, administrative and support service activities
5	Technology, telecommunications
6	Health care, utilities, professional and technical activities
7	Other sector

- **Cross-bucket correlations γ_{bc}** for delta risk, are given by[1]:

Bucket	1	2	3	4	5	6
1	100%	10%	20%	25%	20%	15%
2		100%	5%	15%	20%	5%
3			100%	20%	25%	5%
4				100%	25%	5%
5					100%	5%
6						100%

- **Delta risk factors** for a given bucket are absolute shifts of credit spreads of individual entities at the following tenors: 0.5, 1 , 3 , 5 and 10 years, and the $\boldsymbol{RW_k}$ are the same for all tenors according to buckets:

Bucket	1 a)	1 b)	2	3	4	5	6	7
IG names	0.5%	1.0%	5.0%	3.0%	3.0%	2.0%	1.5%	5.0%
HY and NR names	3.0%	4.0%	12.0%	7.0%	8.5%	5.5%	5.0%	12.0%

- **Correlations ρ_{kl}** between different tenors for the same entity are set to 90%[2].

(1) For cross-bucket correlations, applying across bucket 7 and another bucket $\gamma_{bc} = 0\%$

(2) For unrelated entities of the same and different credit quality, and for entities that are legally related, other correlations are applied.

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Detail
CVA risk framework

For reference credit spread, delta and vega risks are calculated by considering the buckets, the cross-bucket correlations, the delta risk factors and the vega risk factors provided by the BCBS

SA-CVA (6/8)

Reference credit spread

- For **delta** and **vega risks** are calculated. In this regard, **buckets** for delta and vega risks are covered in the annex.
- **Cross-bucket correlations** γ_{bc} for delta and vega risks within the same credit quality category are:

Bucket	1/8	2/9	3/10	4/11	5/12	6/13	7/14
1/8	100%	75%	10%	20%	25%	20%	15%
2/9		100%	5%	15%	20%	15%	10%
3/10			100%	5%	15%	20%	5%
4/11				100%	20%	25%	5%
5/12					100%	25%	5%
6/13						100%	5%
7/14							100%

- **Delta risk factors** for a given bucket. In this regard, the single reference credit spread delta risk factor is a simultaneous absolute shift of credit spreads of all tenors for all reference names in the bucket, and the Sensitivity to reference credit spreads is measured by shifting the credit spreads of all reference names in the bucket by 1 basis point and viding the resulting change in the aggregate CVA by 0.0001.
  - RW_k depend on the reference name's bucket according to:

IG bucket	1	2	3	4	5	6	7
RW	0.5%	1.0%	5.0%	3.0%	3.0%	2.0%	1.5%

HY/NR bucket	8	9	10	11	12	13	14	15
RW	3.0%	4.0%	12.0%	7.0%	8.5%	5.5%	5.0%	12.0%

- **Vega risk factors** for a given bucket**.** In this regard, the single reference credit spread vega risk factor is a simultaneous relative shift of the volatilities of credit spreads of all tenors for all reference names in the bucket; sensitivity to volatility of reference credit spread is measured by shifting the volatilities of credit spreads of all reference names in the bucket by 1% relative to their current values and dividing the resulting change in the aggregate CVA by 0.01; and RW or reference credit spread volatilities are set to $RW_k = RW_\sigma \cdot \sqrt{12}$, where RW_σ is set at 55%.

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Detail
CVA risk framework

For equity, delta and vega risks are calculated by considering the buckets, the cross-bucket correlations, the delta risk factors and the vega risk factors provided by the BCBS

SA-CVA (7/8)

Equity

- **Buckets for delta and vega risks**, and the terminology used are defined in the annex.
- **Cross-bucket correlations γ_{bc}** for delta and vega risks is equal to 15% for all cross-bucket pairs that fall within buckets 1 to 10. γ_{bc} is equal to 0% for all cross-bucket pairs that include bucket 11.
- **Delta risk factors** for a given bucket:
  - The single equity delta risk factor is a simultaneous relative shift of equity spot prices for all reference names in the bucket.
  - The sensitivities to equity delta risk factors are measured by shifting the equity spot prices for all reference names in the bucket by 1% relative to their current values and dividing the resulting change in the aggregate CVA by 0.01.
  - RW_k depend on the reference name's bucket according to the following table:

Bucket no.	1	2	3	4	5	6	7	8	9	10	11
RW	55%	60%	45%	55%	30%	35%	40%	50%	70%	50%	70%

- **Vega risk factors** for a given bucket:
  - The single equity vega risk factor is a simultaneous relative shift of the volatilities for all reference names in the bucket.
  - The sensitivities to equity vega risk factors are measured by shifting the volatilities for all reference names in the bucket by 1% relative to their current values and dividing the resulting change in the aggregate CVA by 0.01.
  - RW for equity volatilities are set to $RW_k = RW_\sigma \cdot \sqrt{2}$ for large capitalisation buckets and to $RW_k = RW_\sigma \cdot \sqrt{6}$ for small capitalisation buckets where RW_σ is set at 55%.

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Detail
CVA risk framework

Finally, for commodities, delta and vega risks are calculated by considering the buckets, the cross-bucket correlations, the delta risk factors and the vega risk factors provided by the BCBS

SA-CVA (8/8)

Commodity

- **Buckets for delta and vega risks** are defined in the annex.
- **Cross-bucket correlations** γ_{bc} for delta and vega risks is equal to 20% for all cross-bucket pairs that fall within buckets 1 to 10. γ_{bc} is equal to 0% for all cross-bucket pairs that include bucket 11.
- **Delta risk factors** for a given bucket:
  - The single commodity delta risk factor is a simultaneous relative shift of commodity spot prices for all commodities in the bucket.
  - The sensitivities to commodity delta risk factors are measured by shifting the spot prices of all commodities in the bucket by 1% relative to their current values and dividing the resulting change in the aggregate CVA by 0.01
  - RW_k depend on the reference name's bucket according to the following table:

Bucket no.	1	2	3	4	5	6	7	8	9	10	11
RW	30%	35%	60%	80%	40%	45%	20%	35%	25%	35%	50%

- **Vega risk factors** for a given bucket:
  - The single commodity vega risk factor is a simultaneous relative shift of the volatilities for all commodities in the bucket.
  - The sensitivities to commodity vega risk factors are measured by shifting the volatilities for all commodities in the bucket by 1% relative to their current values and dividing the resulting change in the aggregate CVA by 0.01.
  - RW for commodity volatilities are set to $RW_k = RW_\sigma \cdot \sqrt{12}$ where RW_σ is set at 55%.

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Detail
Operational risk framework

Regarding the operational risk framework, the BCBS has introduced a single risk-sensitive standardised approach based on three components: the BI, the BIC and the ILM

Standardised approach (1/2)

Components of the standardised approach

- The standardised approach methodology is based on the following components:
  - The **BI** which is a financial-statement-based proxy for operational risk.
  - The **BIC**, which is calculated by multiplying the BI by a set of regulatory marginal coefficients (αi).
  - The **ILM**, which is a scaling factor that is based on a bank's average historical losses and the BIC.

BI

- The BI comprises three components: the **interest, leases and divided component** (ILDC); the **services component** (SC), and the **financial component** (FC)[1].
- Further, the BI is defined as[2]:

$$BI = ILDC + SC + FC$$

- $ILDC = Min\left[\overline{Abs\ (Interest\ income\ -\ Interest\ Expense)}; 2.25\% \cdot \overline{Interest\ Earning\ Assets}\right] + \overline{Dividend\ Income}$
- $SC = Max\left[(\overline{Other\ Operating\ income}); \overline{Other\ Operating\ Expense}\right] + Max\ [\overline{Fee\ income};\ \overline{Fee\ Expense}]$
- $FC = \overline{Abs\ (Net\ P\&L\ Trading\ Book)} + \overline{Abs\ (Net\ P\&L\ Banking\ Book)}$

BIC

- To calculate the BIC, the **BI is multiplied by the marginal coefficients (αi)**. The marginal coefficients increase with the size of the BI as shown in the following table:

Bucket	BI range (in €bn)	BI marginal coefficients (αi)
1	≤ 1	12%
2	1 < LTV ≤ 30	15%
3	> 30	18%

(1) The definitions for each of the components of the BI are provided in the annex.
(2) A bar above a term indicates that it is calculated as the average over three years: t, t-1 and t-2. The absolute value of net items (e.g, interest income – interest expense) should be calculated first year by year. Only after this year by year calculation should the average of the three years be calculated.

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Detail
Operational risk framework

The BCBS has also determined that the minimum operational capital requirement results from the product of the BIC and the ILM

Standardised approach (2/2)

ILM

- A bank's internal operational risk loss experience affects the calculation of operational risk capital through the ILM which is defined as:

$$ILM = Ln\left(exp(1) - 1 + \left(\frac{LC}{BIC}\right)^{0.8}\right)$$

  - In this formula, the **Loss Component (LC) is equal to 15 times average annual operational risk losses** incurred over the previous 10 years. Further, the ILM is equal to one where the loss and business indicator components are equal. Where the LC is greater than the BIC, the ILM is greater than one. Conversely, where the LC is lower than the BIC, the ILM is less than one.
  - The calculation of average losses in the LC must be based on **10 years of high-quality annual loss data**[1].

Operational risk capital requirement

- The operational risk capital requirement under the standardised approach is determined by the **product of the BIC and the ILM**. For banks in bucket 1 (i.e. with BI ≤ €1 billion), internal loss data does not affect the capital calculation. That is, the ILM is equal to 1, so that operational risk capital is equal to the BIC.
- At national discretion, **supervisors may allow the inclusion of internal loss data** into the framework for banks in bucket 1, subject to meeting loss data collection requirements. In addition, at national discretion, supervisors may set the value of ILM equal to 1 for all banks in their jurisdiction. In case this discretion is exercised, banks would still be subject to the full set of disclosure requirements.
- Minimum operational risk capital (ORC) is calculated as follows[2]:

$$ORC = BIC \cdot ILM$$

(1) However, banks that do not have 10 years of high-quality loss data may use a minimum of five years of data to calculate the LC. Those banks that do not have five years of high-quality loss data must calculate the capital requirement based solely on the BI Component. Supervisors may however require a bank to calculate capital requirements using fewer than five years of losses if the ILM is greater than 1.

(2) RWAs for operational risk are equal to 12.5 times ORC.

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Detail

Operational risk framework

Further, the BCBS has specified the use of the standardised approach within a group; the minimum standards for using loss data; general criteria on loss data identification, collection and treatment…

Standardised approach within a group, use of loss data, and general criteria for using LC

Standardised approach within a group

- The standardised approach calculations use:
  - At the **consolidated level**, fully consolidated BI figures, which net all the intragroup income and expenses.
  - At a **sub-consolidated level** use BI figures for the banks consolidated at that particular sub-level.
  - At the **subsidiary level** use the BI figures from the subsidiary.
- When BI figures for sub-consolidated or subsidiary banks reach bucket 2, these banks are required to use loss experience in the standardised approach calculations. In case a subsidiary of a bank belonging to bucket 2 or higher does not meet the qualitative standards for the use of the LC, this subsidiary must calculate the standardised approach capital requirements by applying 100% of the BIC.

Minimum standards for using loss data

- Banks with a BI greater than €1bn are required to use **loss data as a direct input** into the operational risk capital calculations. National supervisors should review the quality of banks' loss data periodically.
- Banks which do not meet the loss data standards are required to hold capital that is at a minimum equal to **100% of the BIC**. In such cases supervisors may require the bank to apply an ILM which is greater than 1.

General criteria for using LC

- The proper identification, collection and treatment of internal loss data are essential prerequisites to capital calculation under the standardised approach. The general criteria for the use of the LC are, among others:
  - Internally generated loss data calculations must be based on a **10-year observation period**.
  - Internal loss data are most relevant when clearly linked to a **bank's current business activities**, technological processes and risk management procedures.
  - A bank's internal loss data must be comprehensive and capture all material activities and exposures from all appropriate subsystems and geographic locations[1].
  - The bank must collect information about the reference dates of operational risk events, including date of occurrence, date of discovery, etc.

(1) The minimum threshold for including a loss event in the data collection and calculation of average annual losses is set at €20,000.

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Detail

Operational risk framework

…specific criteria on loss data identification, collection and treatment; exclusion of losses from the LC, exclusions of divested activities from the BI; inclusion of losses and BI items related to mergers and acquisitions; and disclosure

Specific criteria for using LC, exclusion/inclusions from LC or BI, and disclosure

Specific criteria for using LC

- The specific criteria for the use of the LC, regarding loss data identification, collection and treatment, cover :
  - **Building of the standardised approach loss data set**. In this regard, an acceptable loss data set from the available internal data requires that the bank develop policies and procedures to address several features, including gross loss definition, reference date and grouped losses.
  - **Gross loss, net loss, and recovery definitions**. Gross loss is a loss before recoveries of any type[1]. Net loss is defined as the loss after taking into account the impact of recoveries. The recovery is an independent occurrence, related to the original loss event, separate in time, in which funds or inflows of economic benefits are received from a third party.

Exclusion of losses from LC

- Banking organisations may request **supervisory approval** to exclude certain operational loss events that are no longer relevant to the banking organisation's risk profile.
- The total loss amount and number of exclusions must be **disclosed under Pillar 3**.

Exclusions of divested activit. from BI

- Banking organisations may request **supervisory approval** to exclude divested activities from the calculation of the BI. Such exclusions must be disclosed under Pillar 3.

Inclusion of losses and BI items on mergers & acquisitions

- Losses and the measurement of the BI must include **losses and BI items that result from acquisitions** of relevant business and **mergers**.

Disclosure

- All banks with a BI greater than €1bn, or which use internal loss data in the calculation of operational risk capital, are required to disclose their annual loss data for each of the **10 years** in the ILM calculation window, as well as each of the BI sub-items for each of the three years of the BIC component window.
- Loss data is required to be reported on both a gross basis and after recoveries and loss exclusions.

(1) In the gross loss computation of the loss data set certain items must be included (e.g. direct charges, including impairments and settlements)

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Detail

Output floor

Banks will be subject to a floor requirement that is applied to RWAs in order to reduce excessive variability of RWAs and to enhance the comparability of RWAs ratios. Further, this output floor will be calculated according to the SA for different risks

Requirements and calculation

Requirements

- As set out in the Basel III framework banks must meet the following capital requirements:
  - **CET1** must be at least **4.5% of RWAs** at all times.
  - **Tier 1 capital** must be at least **6% RWAs** at all times.
  - **Total capital** (i.e. Tier 1 and Tier 2) must be at least **8% RWAs** at al times.
- In addition, all banks shall be subject to a **CET1 capital conservation buffer** set at 2.5% of RWAs, they may also be subject to a countercyclical capital buffer requirement, and banks identified as G-SIBs are also subject to additional higher-loss absorbency requirements and TLAC requirements.
- Banks' RWAs must be calculated that banks must use to determine compliance with the above-mentioned requirements must be calculated as the maximum of: i) **total RWAs calculated using the approaches with supervisory approval to use** (including both standardised and internally modelled-based approaches); and ii) **72.5% of the total RWAs** calculated using only the **standardised approaches**.

Calculation

- For calculating the output floor, banks should consider the following standardised approaches for:
  - **Credit risk** (the SA as described above). When calculating the degree of credit risk mitigation, banks must use the carrying value when applying the simple approach or the comprehensive approach with standard supervisory haircuts (including failed trades and non-delivery-versus-payment transactions).
  - **Counterparty credit risk** (the SA-CCR as described above). In this regard, the exposure amount must then be multiplied by the relevant borrower RW using the SA for credit risk to calculate RWA under the SA for credit risk.
  - **CVA risk**. The SA-CVA, the BA-CVA or 100% of a bank's counterparty credit risk capital requirement[1].
  - **Securitisation framework**. The SEC-ERBA, the SEC-SA or a 1250% RW.
  - **Market risk** (the standardised approach for market risk)[2].
  - **Operational risk** (the standardised approach for operational risk as described below).

(1) Depending on which approach the bank uses for CVA risk.
(2) The SEC-ERBA, SEC-SA or a 1250% RW must also be used when determining the default risk charge component for securitisations held in the TB.

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Detail

Output floor

Regarding the disclosure of the output floor, banks must provide two sets of risk-weighted capital ratios, including and excluding the capital floor in the calculation of RWAs. Moreover, the BCBS has determined a phase-in period that will begin as of 1 January 2022

Disclosure requirements and transitional measures

Disclosure requirements

- Banks must disclose two sets of risk-weighted capital ratios:
  - Ratios that **include the capital floor** in the calculation of RWAs.
  - Ratios that **exclude the capital floor** in the calculation of RWAs.
- In addition, banks must disclose **more granular information** related to the calculation of their RWAs under internally-modelled and standardised approaches, which will be set out in forthcoming disclosure templates as part of the Committee's Pillar 3 disclosure framework.

Transitional measures

- Despite the output floor will be implemented as of **January 2022**, the BCBS has determined the following phase-in period:

Date	Output floor calibration
1 January 2022	50%
1 January 2023	55%
1 January 2024	60%
1 January 2025	65%
1 January 2026	70%
1 January 2027	72.5%

- During the phase-in period, supervisors may exercise **national discretion** to cap the incremental increase in a bank's total RWAs that results from the application of the floor. This transitional cap will be set at **25% of a bank's RWAs** before the application of the floor.

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Detail

Leverage ratio

The BCBS has also reviewed the LR framework, establishing a 3% LR minimum requirement at all times. In this regard, the capital measure of the LR is comprised by Tier 1 capital whereas the exposure measure of the LR is the sum of…

Definition, requirements and exposure measure

Definition and requirements

- The LR which is defined as follows:

$$Leverage\ ratio = \frac{Capital\ measure}{Exposure\ measure}$$

- In this regard, the capital measure for the LR is comprised by **Tier 1 capital**. Further, both the capital measure and the exposure measure are to be calculated on a quarter-end basis. However, banks may, subject to supervisory approval, use more frequent calculations as long as they do so consistently.
- Banks must meet a **3% LR minimum requirement** at all times.
- In addition, banks identified as **G-SIBs** must also meet a **LR buffer requirement** which must be met with Tier 1 capital and will be set at **50%** of a G-SIB's higher-loss absorbency risk-weighted requirements. In this regard, the capital distribution constraints imposed on G-SIBs will depend on the G-SIB's CET1 risk-weighted ratio and its leverage ratio.

Exposure measure

- The leverage ratio exposure measure generally follows **gross accounting values**.
- Unless specified, banks **must not take account of physical or financial collateral**, **guarantees or other CRM techniques** to reduce the LR exposure measure, nor may banks net assets and liabilities. To ensure consistency **any item deducted from Tier 1 capital** according to the Basel III framework and regulatory adjustments other than those related to liabilities **may be deducted from the LR** exposure measure.
- **Liability items must not be deducted** from the LR exposure measure. Moreover, at national discretion, and to facilitate the implementation of monetary policies, a jurisdiction may temporarily exempt central bank reserves from the leverage ratio exposure measure in exceptional macroeconomic circumstances[1].
- A **bank's total LR exposure measure** is the sum of the following exposures: i) on-balance sheet exposures (excluding on-balance sheet derivative and SFT exposures); ii) derivative exposures; iii) SFT exposures; and iv) OBS items.

(1) A jurisdiction applying this discretion must also increase the calibration of the minimum leverage ratio requirement commensurately to offset the impact of exempting central bank reserves.

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Detail
Leverage ratio

…on-balance sheet exposure, derivative exposures…

On-balance sheet and derivative exposures

On-balance sheet exposures

- Banks must include **all balance sheet assets** in their LR exposure measure, including on-balance sheet derivatives collateral and collateral for SFTs, with the exception of on-balance sheet derivative and SFT assets covered by derivatives and SFT exposures.
- **On-balance sheet**, **non-derivative assets are included** in the LR exposure measure at their accounting values less deductions for associated specific provisions. In addition, general provisions which have reduced Tier 1 capital may be **deducted** from the LR exposure measure.

Derivative exposures

- **Treatment of derivatives**. Exposures to derivatives are included in the LR exposure measure by two components: i) RC; and ii) PFE. In this regard, banks must calculate their exposures associated with all derivative transactions as a scalar multiplier alpha set at 1.4 times the sum of the RC and the PFE.
- **Treatment of related collateral**. Collateral received may not be netted against derivative exposures whether or not netting is permitted under the bank's operative accounting or risk-based framework. Hence, when calculating the exposure amount RC cannot be reduced by collateral received and that the relevant multiplier is fixed at one for the purpose of the PFE calculation. Regarding collateral provided, banks must gross up their LR exposure measure by the amount of any derivatives collateral.
- **Treatment of cash variation margin**. If certain conditions are met (e.g. Variation margin is calculated and exchanged on at least a daily basis based on mark-to-market valuation of derivative positions), the cash portion of variation margin exchanged between counterparties may be used to reduce the replacement cost portion of the LR exposure measure, and the receivables assets from cash variation margin provided may be deducted from the LR exposure measure.
- **Treatment of clearing services**. Where a bank acting as clearing member (CM) offers clearing services to clients, the CM's trade exposures to the CCP that arise when the CM is obligated to reimburse the client for any losses suffered due to changes in the value of its transactions in the event that the CCP defaults must be captured by applying the same treatment that applies to any other type of derivative transaction.
- **Additional treatment for written credit derivatives**. In this regard, the BCBS believes it is appropriate to treat these derivatives consistently with cash instruments (e.g. loans, bonds) for the LR exposure measure.

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Detail
Leverage ratio

…. securities financing transitions exposures and off-balance sheet items

SFTs and OBS items

SFTs

- **General treatment of SFTs** (bank acting as principal): the LR exposure measure includes the sum of the following amounts:
  - Gross SFT assets recognised for accounting purposes (i.e. with no recognition of accounting netting), with some adjustments.
  - A measure of CCR calculated as the current exposure without an add-on for PFE.
- **Sale accounting transactions**: leverage may remain with the lender of the security in an SFT whether or not sale accounting is achieved under the operative accounting framework.
- **Bank acting as agent in an SFT**: when acting as an agent, the bank generally provides an indemnity or guarantee to only one of the two parties involved, and only for the difference between the value of the security or cash its customer has lent and the value of collateral the borrower has provided. In this situation, the bank is exposed to the counterparty of its customer for the difference in values rather than to the full exposure to the underlying security or cash of the transaction (as is the case where the bank is one of the principals in the transaction).

OBS items

- These items include commitments (including liquidity facilities), whether or not unconditionally cancellable, direct credit substitutes, acceptances, standby letters of credit and trade letters of credit.
- If the OBS item is treated as a **derivative exposure** per the bank's relevant accounting standard, then the item must be measured as a derivative exposure for the purpose of the LR exposure measure. In this case, the bank does not need to apply the OBS item treatment to the exposure.
- In the risk-based capital framework, OBS items are converted under the SA for credit risk into **credit exposure equivalents** through the use of CCFs.
- In addition, specific and general provisions set aside against OBS exposures that have decreased Tier 1 capital may be **deducted** from the credit exposure equivalent amount of those exposures. However the resulting total off-balance sheet equivalent amount for OBS exposures **cannot be less than zero**.

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Index

Introduction

Executive summary

Detail

Next steps

Annex

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Next steps

The revised SA and IRB frameworks for credit risk, the revised CVA and operational frameworks, as well as the revised market risk framework will be implemented by 1 January 2022. Moreover, the output floor will be phased-in, applying a 72.5% by 1 January 2027

Next steps

- The implementation date of the revised SA for credit risk, the revised IRB framework, the revised CVA framework, and the revised operational risk framework will be **1 January 2022**.
- Further, both the implementation and regulatory reporting date for the revised market risk framework (published in January 2016) will be **1 January 2022**.
- The LR framework will be applicable by **1 January 2018** (using the existing exposure definition) and by **1 January 2022** (using the revised exposure definition). Further, the G-SIBs buffer will be applicable by **1 January 2022**.
- Moreover, the **transitional arrangement** for phasing in the aggregate output floor will be:
  - **50%** by 1 January 2022.
  - **55%** by 1 January 2023.
  - **60%** by 1 January 2024.
  - **65%** by 1 January 2025.
  - **70%** by 1 January 2026.
  - **72.5%** by 1 January 2027.

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Index

Introduction

Executive summary

Detail

Next steps

Annex

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Annex
CVA risk framework

For reference credit spreads, there are 15 buckets for delta and vega risks classified according to the credit quality and sector

Buckets for reference credit spread

Bucket number	Credit quality	Sector
1	IG	Sovereigns including central banks, MDBs
2		Local government, government-backed non-financials, education and public administration
3		Financials including government-backed financials
4		Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying
5		Consumer goods and services, transportation and storage, administrative and support service activities
6		Technology, telecommunications
7		Health care, utilities, professional and technical activities
8	HY & NR	Sovereigns including central banks, MDBs
9		Local government, government-backed non-financials, education and public administration
10		Financials including government-backed financials
11		Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying
12		Consumer goods and services, transportation and storage, administrative and support service activities
13		Technology, telecommunications
14		Health care, utilities, professional and technical activities
15	(Not applicable)	Other sector

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Annex
CVA risk framework

For equity delta and vega risks there are 11 buckets classified according to the size, region and sector

Buckets and terminology for equity

Bucket number	Size	Region	Sector
1	Large	Emerging market economies	Consumer goods and services, transportation and storage, administrative and support service activities, healthcare, utilities
2			Telecommunications, industrials
3			Basic materials, energy, agriculture, manufacturing, mining and quarrying
4			Financials including government-backed financials, real estate activities, technology
5		Advanced economies	Consumer goods and services, transportation and storage, administrative and support service activities, healthcare, utilities
6			Telecommunications, industrials
7			Basic materials, energy, agriculture, manufacturing, mining and quarrying
8			Financials including government-backed financials, real estate activities, technology
9	Small	Emerging market economies	All sectors described under bucket numbers 1, 2, 3, and 4
10		Advanced economies	All sectors described under bucket numbers 5, 6, 7, and 8
11	(Not applicable)		Other sector

- The terminology used in the equity bucket definition should be understood as follows:
  - **Market capitalisation** (market cap) is defined as the sum of the market capitalisations of the same legal entity or group of legal entities across all stock markets globally.
  - **Large market cap** is defined as a market capitalisation equal to or greater than USD 2 billion and **small market cap** is defined as a market capitalisation of less than USD 2 billion.
  - The **advanced economies** are, among others, Canada, the United States, Mexico and the Euro area.
  - To assign a risk exposure to a sector, banks must rely on a classification that is commonly used in the market for grouping issuers by industry sector. For multinational multi-sector equity issuers, the allocation to a particular bucket must be done according to the most material region and sector in which the issuer operates.

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Annex
CVA risk framework

For commodity delta and vega risks there are 11 buckets classified according to the commodity group

Buckets for commodity

Bucket number	Commodity group	Examples
1	Energy – Solid combustibles	Coal, charcoal, wood pellets, nuclear fuel (such as uranium)
2	Energy – Liquid combustibles	Crude oil (such as Light-sweet and Brent); biofuels (such as bioethanol and biodiesel); petrochemicals (such as propane, and butane); refined fuels (such as jet fuel, kerosene, gasoil, fuel oil, and diesel)
3	Energy – Electricity and carbon trading	Electricity (such as spot, day-ahead, peak and off-peak); carbon emissions trading (such as certified emissions reductions, in-delivery month EUA, RGGI CO2 allowance and renewable energy certificates)
4	Freight	Dry-bulk route (such as capesize, panamex, handysize and supramax); liquid-bulk/gas shipping route (such as suezmax, aframax and very large crude carriers)
5	Metals – non-precious	Base metal (such as aluminium, and zinc); steel raw materials (such as steel billet, steel wire, iron ore, tungsten and tantalum); minor metals (such as cobalt, manganese, molybdenum)
6	Gaseous combustibles	Natural gas; liquefied natural gas
7	Precious metals (including gold)	Gold; silver; platinum; palladium
8	Grains & oilseed	Corn; wheat; soybean (such as soybean seed, soybean oil and soybean meal); oats; palm oil; canola; barley; rapeseed (such as rapeseed seed, rapeseed oil, and rapeseed meal); red bean, sorghum; coconut oil; olive oil; peanut oil; sunflower oil; rice
9	Livestock & dairy	Cattle (such live and feeder); hog; poultry; lamb; fish; shrimp; dairy (such as milk, whey, and cheese)
10	Softs and other agriculturals	Cocoa; coffee (such as arabica and robusta); tea; citrus and orange juice; potatoes; sugar; cotton; wool; lumber and pulp; rubber
11	Other commodity	Industrial minerals (such as potash, fertiliser and phosphate rocks), rare earths; terephthalic acid; flat glass

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Annex
Operational risk framework

The BCBS has provided the definitions for each of the component of the BI, i.e. interest, lease and dividend; services…

Business indicator definitions (1/2)[1]

Business Indicator definitions			
BI Component	P&L or balance sheet items	Description	Typical sub-items
Interest, lease and dividend	Interest income	Interest income from all financial assets and other interest income (includes interest income from financial and operating leases and profits from leased assets).	• Interest income from loans and advances, assets available for sale, assets held to maturity, trading assets, financial leases and operational leases • Interest income from hedge accounting derivatives • Other interest income • Profits from leased assets
	Interest expenses	Interest expenses from all financial liabilities and other interest expenses (includes interest expense from financial and operating leases, losses, depreciation and impairment of operating leased assets).	• Interest expenses from deposits, debt securities issued, financial leases, and operating leases • Interest expenses from hedge accounting derivatives • Other interest expenses • Losses from leased assets • Depreciation and impairment of operating leased assets.
	Interest earning assets (balance sheet item)	Total gross outstanding loans, advances, interest bearing securities (including government bonds), and lease assets measured at the end of each financial year.	
	Dividend income	Dividend income from investments in stocks and funds not consolidated in the bank's financial statements, including dividend income from non-consolidated subsidiaries, associates and joint ventures.	
Services	Fee and commission income	Income received from providing advice and services. Includes income received by the bank as an outsourcer of financial services.	Fee and commission income from: • Securities (issuance, origination, reception, transmission, execution of orders on behalf of customers) • Clearing and settlement; Asset management; Custody; Fiduciary transactions; Payment services; Structured finance; Servicing of securitisations; Loan commitments and guarantees given; and foreign transactions

(1) However, there are certain P&L items that do not contribute to any of the items of the BI (e.g. income and expenses from insurance or reinsurance business, corporate income tax, etc.).

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Annex
Operational risk framework

…,and financial, which includes net profits (loss) on the TB and on the BB

Business indicator definitions (2/2)

Business Indicator definitions			
BI Component	P&L or balance sheet items	Description	Typical sub-items
Services (continue)	Fee and commission expenses	Expenses paid for receiving advice and services. Includes outsourcing fees paid by the bank for the supply of financial services, but not outsourcing fees paid for the supply of non-financial services (e.g. IT, HHRR)	Fee and commission expenses from: • Clearing and settlement; custody; servicing of securitisations; loan commitments and guarantees received; and foreign transactions
	Other operating income	Income from ordinary banking operations not included in other BI items but of similar nature (income from operating leases should be excluded)	• Rental income from investment properties • Gains from non-current assets and disposal groups classified as held for sale not qualifying as discontinued operations (IFRS 5.37)
	Other operating expenses	Expenses and losses from ordinary banking operations not included in other BI items but of similar nature and from operational loss events (expenses from operating leases should be excluded)	• Losses from non-current assets and disposal groups classified as held for sale not qualifying as discontinued operations (IFRS 5.37) • Losses incurred as a consequence of operational loss events (e.g. fines, penalties, settlements), which have not been provisioned/reserved for in previous years • Expenses related to establishing provisions/reserves for operational loss events
Financial	Net profit (loss) on the TB	• Net profit/loss on trading assets and trading liabilities (derivatives, debt securities, equity securities, etc.) • Net profit/loss from hedge accounting • Net profit/loss from exchange differences	
	Net profit (loss) on the BB	• Net profit/loss on financial assets and liabilities measured at fair value through profit and loss • Realised gains/losses on financial assets and liabilities not measured at fair value through profit and loss (loans and advances, assets available for sale, assets held to maturity, financial liabilities measured at amortised cost) • Net profit/loss from hedge accounting • Net profit/loss from exchange differences	

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