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Basel III: Post-Crisis Reforms

Implementation Timeline

Focus: Capital Definitions, Capital Buffers and Liquidity Requirements — Basel III

Focus: Capital Requirements

2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027

1 January 2018
Full implementation of Leverage Ratio (Existing exposure definition)

1 January 2022
Full implementation of:
1. Revised standardised approach for credit risk;
2. Revised IRB framework;
3. Revised CVA framework;
4. Revised operational risk framework;
5. Revised market risk framework (Fundamental Review of Trading Book); and
6. Leverage Ratio (revised exposure definition).

Transitional implementation
Output floor: 50%

1 January 2023 Output floor: 55%

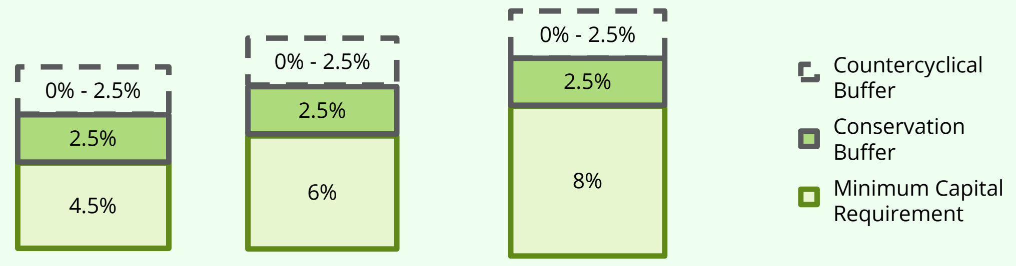
1 January 2024 Output floor: 60%

1 January 2025 Output floor: 65%

1 January 2026 Output floor: 70%

1 January 2027 Output floor: 72.5%

Capital Ratios



Core Equity Tier 1 (CET 1) | **Tier 1 (T1)** | **Total Capital (Tier 1 + Tier 2)**

Standardised Approach for Credit Risk

Revisions to the Existing Standardised Approach

- **Exposures to Banks**
  Bank exposures will be risk-weighted based on either the External Credit Risk Assessment Approach (ECRA) or Standardised Credit Risk Assessment Approach (SCRA). Banks are to apply ECRA where regulators do allow the use of external ratings for regulatory purposes and SCRA for regulators that don't.

- **Exposures to Multilateral Development Banks (MDBs)**
  For exposures that do not fulfil the eligibility criteria, risk weights are to be determined by either SCRA or ECRA.

- **Exposures to Corporates**
  A more granular look-up table as well as a specific risk weight for small and medium-sized enterprises (SMEs) have been developed.

- **Retail Exposures (Excluding Real Estate)**
  Retail exposures are broken down into more granular types such as transactors and revolvers. A Qualifying Retail Revolving Exposure (QRRE) transactor is the exposure to an obligor in relation to a revolving credit facility where the balance has been repaid in full at each scheduled repayment date for the previous 12 months or there have been no drawdowns over the previous 12 months. All exposures that are not QRRE transactors are QRRE revolvers.

Retail Exposures Excluding Real Estate	Regulatory Retail (Non-Revolving)	Regulatory Retail (Revolving)		Other Retail
		Transactors	Revolvers	
Risk Weight	75%	45%	75%	100%

- **Residential Real Estate (RRE) and Commercial Real Estate (CRE) Exposures**
  More risk-sensitive approaches have been developed. Variable risk weights, based on mortgages' Loan-to-Value (LTV) ratios, will replace the previous flat risk weights of 35% and 100% for RRE and CRE respectively.

- **Exposures to Subordinated Debts and Equity**
  A more granular risk weight treatment applies relative to the current flat risk weight.

Exposures	Subordinated debt and capital other than equities	Equity exposures to certain legislated programmes	Speculative Unlisted Equity	All Other Equity Exposures
Risk Weight	150%	100%	400%	250%

- **Exposures to Off-Balance Sheet Items**
  Credit Conversion Factors (CCFs) have been made more risk-sensitive such as introducing positive CCFs for Unconditionally Cancellable Commitments (UCCs).

Off Balance Sheet Exposures	UCCs	Commitments except UCCs	Note Issuance and Revolving Underwriting Facilities	Certain transaction-related contingent items	Short term self-liquidating trade letters of credit	Direct credit substitutes and other exposures
CCF	10%	40%	50%	50%	20%	100%

New Categories of Exposures

- **Exposure to Covered Bonds**
  Rated covered bonds will be risk weighted based on issue specific rating while risk weights for unrated covered bonds will be inferred from the issuer's ECRA or SCRA risk weights.

- **Exposure to Project Finance, Object and Commodities Finance**
  A new standalone treatment for specialised lending, a subcategory of the corporate exposure class.

- **Land acquisition, development and construction (ADC) exposures**
  New treatment for ADC financing, a subcategory of the real estate exposure class.

ADC Exposures	Risk Weight
Loan to Company / SPV	150%
Residential ADC Loan	100%

Exposures to Banks

ECRA							SCRA			
Risk Weight	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated	**Risk Weight**	Grade A	Grade B	Grade C
Base	20%	30%	50%	100%	150%	SCRA	**Base**	40% * 30% if CET 1 ≥ 14% and T1 Leverage Ratio ≥ 5%	75%	150%
Short term exposures	20%			50%			**Short term exposures**	20%	50%	

Exposures to MDBs

Eligible Criteria Met		ECRA							SCRA			
Risk Weight	Rated/ Unrated	**Risk Weight**	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated	**Risk Weight**	Grade A	Grade B	Grade C
Base	0%	**Base**	20%	30%	50%	100%	150%	50%	**Base**	50%		

Exposures to Corporates

ECRA							SCRA		
External Rating of Counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated	**Grades**	Investment	Others
Risk Weight	20%	50%	75%	100%	150%	100% or 85% if Corporate SME	**Non-SME Corporate**	65%	100%
							SME Corporate	85%	

Residential Real Estate (RRE) Exposures

General RRE								
Risk Weights	LTV ≤ 50%	50% < LTV ≤ 55%	55% < LTV ≤ 60%	60% < LTV ≤ 80%	80% LTV ≤ 90%	90% < LTV ≤ 100%	LTV > 100%	Criteria not met
Whole Loan Approach	20%	25%	25%	30%	40%	50%	70%	Risk weight of counterparty
Loan-Splitting Approach	20%		Risk weight (RW) of counterparty					
Income-Producing Residential Real Estate (IPRRE)								
Risk Weights	LTV ≤ 50%	50% < LTV ≤ 60%		60% < LTV ≤ 80%	80% < LTV ≤ 90%	90% < LTV ≤ 100%	LTV > 100%	Criteria not met
Whole Loan Approach	30%	35%		45%	60%	75%	105%	150%

Commercial Real Estate (CRE) Exposures

General CRE					Income-Producing Commercial Real Estate (IPCRE)				
Risk Weight	LTV ≤ 55%	55% < LTV ≤ 60%	LTV > 60%	Criteria not met	**Risk Weight**	LTV ≤ 60%	60% < LTV ≤ 80%	LTV > 80%	Criteria not met
Whole Loan Approach	Min (60%, RW of counterparty)		RW of counterparty	RW of counterparty	**Whole Loan Approach**	70%	90%	110%	150%
Loan-Splitting Approach	Min (60%, RW of counterparty)	RW of counterparty							

Exposures to Covered Bonds

Rated Covered Bonds					Unrated Covered Bonds						
Issue-Specific Rating	AAA to AA -	A + to BBB -	BB + to B -	Below B -	**Risk Weight of Issuing Bank**	30%	40%	50%	75%	100%	150%
Risk Weight	10%	20%	50%	100%	**Risk Weight**	15%	20%	25%	35%	50%	100%

Exposures to Project, Object and Commodities Finance

ECRA							SCRA		
External Rating of Counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated	**Exposures (excluding real estate)**	Project Finance	Object and Commodity Finance
Risk Weight	20%	50%	75%	100%	150%	100% or 85% if Corporate SME	**Risk Weight**	130% pre-operational phase 100% operational phase 80% operational phase (high quality)	100%

Internal Rating-Based Approach for Credit Risk

Revision in the Scope of Internal Ratings-Based (IRB) Approaches

Exposure	Basel II	Basel III: Post Crisis Reforms
Large and Mid-Sized Corporates (Consolidated revenues > €500 Million)	• Advanced IRB (A-IRB), • Foundation IRB (F-IRB), • Standardised Approach (SA)	• F-IRB • SA
Banks and Other Financial Institutions	• A-IRB • F-IRB • SA	• F-IRB • SA
Equities	• Various IRB Approaches	• SA

Specification of Input Floors

Exposure		Probability of Default (PD)	Loss Given Default (LGD)		Exposure at Default (EAD)
			Unsecured	Secured	
Corporate		5 bps	25%	By collateral type: • 0% financial • 10% receivables • 10% CRE/RRE • 15% other physical	Sum of (i) on balance sheet exposures; and (ii) 50% of off balance sheet exposure using applicable CCFs in SA
Retail	**Mortgages**	5 bps	N/A	5%	
	QRRE Transactors	5 bps	50%	N/A	
	QRRE Revolvers	10 bps	50%	N/A	
	Other Retail	5 bps	30%	By collateral type: • 0% financial • 10% receivables • 10% CRE/RRE • 15% other physical	

Supervisory Specified Parameters in the F-IRB Approach

Secured Exposures
- Non-financial collateral: LGD reduced and haircuts increased
- Financial collateral: Haircuts revised to be more granular

Unsecured Exposures
- Non-financial corporates: LGD reduced to 40%
- Banks, Securities Firms and Other Financial Institutions: LGD retained at 45%

Additional Enhancement

The 1.06 scaling factor, currently applied to risk-weighted assets (RWAs) determined by the IRB approach to credit risk, has been removed.

Market Risk – Fundamental Review of Trading Book

More Defined Regulatory Boundary Between Banking and Trading Book

The revised boundary treatment retains the link between the regulatory trading book and the set of instruments that banks generally hold for trading purposes but at the same time addresses the weaknesses (i.e. arbitrage between the two sets of books) in the previous standard. Key revisions are:

- Additional guidance on the appropriate contents of the trading book
- Reducing the ability to arbitrage the boundary
- Enhanced supervisory powers and reporting requirements.
- Clearer treatment of internal risk transfers across the regulatory boundary

Market Risk – The Standardised Approach (SA)

Revised Standardised Approach

Using elements from the former standardised measurement method, the Sensitivities based method builds on the elements and expand the use of delta, vega and curvature risk to factor sensitivities. The standardised approach capital charge is the sum of the sensitivities Based Method capital charge, default risk charge and residual add on.

Sensitivities Based Method

Classification of instrument into risk class and risk factor

Delta Risk – A risk measure based on sensitivities of a bank's trading book to regulatory delta risk factors.

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Vega Risk – A risk measure (for instruments with optionality) based on sensitivities to vega risk factors to be used as inputs to a similar aggregation formula as for Delta risk.

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Curvature Risk – A risk measure (for instruments with optionality) , capturing the incremental risk not captured by the delta risk of price changes in the value of an option, based on two stress scenarios per risk factor involving an upward and downward shock where the worst loss is accounted in the capital charge.

Step 1: Risk Factor Level

Delta / Vega Risk:

Calculate the weighted net sensitivity (WS_k) across all instruments to their respective risk factor k.

$$WS_k = s_k \cdot RW_k$$

where s_k is the net sensitivity and RW_k is the corresponding risk weight

Curvature Risk:

Calculate the curvature risk charge for curvature risk factor k.

$$CVR_k = \begin{bmatrix} \sum_i \left\{ V_i\left(x_k^{(RW^{(curvature)}+)}\right) - V_i(x_k) - RW_k^{(curvature)} \cdot s_{ik} \right\} \\ \sum_i \left\{ V_i\left(x_k^{(RW^{(curvature)}-)}\right) - V_i(x_k) + RW_k^{(curvature)} \cdot s_{ik} \right\} \end{bmatrix}$$

where:
- *i* is an instrument subject to curvature risks associated with risk factor k;
- x_k is the current level of risk factor k;
- $V_i(x_k)$ is the price of instrument *i* depending on the current level of risk factor k;
- $V_i\left(x_k^{(RW^{(curvature)}+)}\right)$ and $V_i\left(x_k^{(RW^{(curvature)}-)}\right)$ both denote the price of instrument *i* after x_k is shifted upward and downward;
- $RW_k^{(curvature)}$ is the risk weight for curvature risk factor k for instrument *i*;
- s_{ik} is the delta sensitivity/sum of delta sensitivities to all tenors of the relevant curve of instrument *i*.

Step 2: Bucket Level

Delta / Vega Risk:

Compute risk position for bucket b, K_b, by aggregating weighted sensitivities within each bucket using the corresponding prescribed correlation ρ_{kl}.

$$K_b = \sqrt{\sum_k WS_k^2 + \sum_k \sum_{k \neq l} \rho_{kl} WS_k WS_l}$$

Curvature Risk:

Aggregate the curvature risk exposure within each bucket using the corresponding correlation ρ_{kl}.

$$K_b = \sqrt{max\left[0, \sum_k max(CVR_k, 0)^2 + \sum_k \sum_{k \neq l} \rho_{kl} CVR_k CVR_l \, \varphi(CVR_k, CVR_l)\right]}$$

where $\psi(CVR_k, CVR_l) = 0$ if CVR_k and CVR_l both have negative signs and $\psi(CVR_k, CVR_l) = 1$ in other cases

Step 3: Risk Class Level

Delta / Vega Risk:

Risk charge is determined from risk positions aggregated between buckets within each risk class using the corresponding correlations γ_{bc}.

$$Risk\ Charge = \sqrt{\sum_b K_b^2 + \sum_b \sum_{c \neq b} \gamma_{bc} S_b S_c}$$

where $S_b = \sum_k WS_k$ for all risk factors in bucket b and $S_c = \sum_k WS_k$ for all risk factors in bucket c

If risk charge is an imaginary number, S_b and S_c are computed using an alternative specification.

$$S_b = max\left[min\left(\sum_k WS_k, K_b\right), -K_b\right], \quad S_c = max\left[min\left(\sum_k WS_k, K_c\right), -K_c\right]$$

Curvature Risk:

Aggregate the curvature risk positions across bucket within each risk class using the corresponding correlations γ_{bc}.

$$Curvature\ Risk = \sqrt{\sum_b K_b^2 + \sum_c \sum_{c \neq b} \gamma_{bc} S_b S_c \varphi(S_b, S_c)}$$

where $S_b = \sum_k CVR_k$ for all risk factors in bucket b and $S_c = \sum_k CVR_k$ for all risk factors in bucket c

If risk charge is an imaginary number, S_b and S_c are computed using an alternative specification.

$$S_b = max\left[min\left(\sum_k CVR_k, K_b\right), -K_b\right], \quad S_c = max\left[min\left(\sum_k CVR_k, K_c\right), -K_c\right]$$

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Default Risk Charge (DRC)

The standardised DRC as a whole is calibrated to the credit risk treatment in the banking book to reduce the potential discrepancy in capital requirements for similar risk exposures across the banking book and trading book. DRC is computed for non-securitisations, securitisations (non-correlation trading portfolio) and securitisations (correlation trading portfolio).

1. Determine gross Jump-to-default (JTD) risk positions for each instrument subject to default risk.
2. Compute net JTD risk positions by offsetting JTD amounts of long and short exposures with respect to the same obligor (where permissible) producing net long and net short amounts in distinct obligors.
3. Calculate DRC by discounting the net short exposures by a hedge benefit ratio and applying default risk weights to arrive at a capital charge.

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Residual Add-on

This captures any other risks beyond the main risk factors already. It provides for a simple and conservative capital treatment for the more sophisticated/complex instruments that would otherwise not be captured in a practical manner under the other two components of the revised standardised approach.

The Residual Risk Add-on is the simple sum of gross notional amounts of the instruments bearing residual risks, multiplied by a risk weight of 1.0% for instruments with an exotic underlying and a risk weight of 0.1% for instruments bearing other residual risks.

Market Risk – The Internal Models Approach (IMA)

Determining the Eligibility of Trading Activities for the IMA

Step 1

Evaluate bank's organisational infrastructure and firm-wide internal risk capital model based on
- **Qualitative**; and
- **Quantitative** factors.

Step 2

Banks must nominate, as well as specify in writing the nomination bases, which **trading desks** are
- In-scope for model approval; and
- Out-of-scope (on the SA).

Step 3

Risk factors, where there are continuously available "real" prices, will be eligible to be included in the bank's internal models for regulatory capital.

Trading Desk Definitions

For the purpose of the regulatory capital framework, a trading desk

- Is an unambiguously defined group of traders or trading accounts;
- Must have a well-defined business strategy;
- Must have a clear risk management structure; and
- Must be proposed by the bank but approved by regulators.

Qualitative Standards

Banks must meet the required qualitative criteria before being permitted to use the IMA. These qualitative criteria include:

- Having an independent risk control unit
- Conducting regular backtesting and profit and loss (P&L) attribution programmes
- Conducting the initial and ongoing independent validation of all internal models
- Active involvement of the Board of directors and senior management in the risk control process
- Having a routine and rigorous programme of stress testing
- Approval by Regulatory for any significant changes to a regulatory-approved model prior to implementation
- Having a regular independent review of the risk measurement system

Quantitative Standards

In the revised IMA, a single Expected Shortfall (ES) metric replaces VaR and stressed VaR. ES measures the riskiness of a position by considering both the size and the likelihood of losses above a certain confidence level (i.e. TVaR). Banks will have flexibility in devising the precise nature of their models, but the following minimum standards will apply for the purpose of calculating their capital charge.

- ES must be computed on a daily basis
- A 97.5th percentile, one-tailed confidence level is to be used for ES computation
- Liquidity horizons must be reflected by scaling an ES calculated on a base horizon
- ES must be calibrated to a period of stress
- Datasets are to be updated at least once a month
- Models must accurately capture the unique risks associated with options
- Meet capital requirement (C_A) – expressed as the higher of the previous day's market risk charge and the average market risk charger in the preceding 60 days – on a daily basis

Expected Shortfall

- ES for a liquidity horizon must be calculated from an ES at a base liquidity horizon of 10 days (i.e. T = days)

$$ES = \sqrt{[\,ES_T(P)]^2 + \sum_{j \geq 2} \left[ES_T(P,j) \sqrt{\frac{(LH_j - LH_{j-1})}{T}} \right]^2}$$

where:
- T is the length of the base horizon
- $ES_T(P)$ is the ES at horizon T of a portfolio with positions P (p_i) with respect to shocks to all risk factors that the positions P are exposed to
- $ES_T(P,j)$ is the ES at horizon T of a portfolio with positions P = (p_i) with respect to shocks for each position p_i in the subset of risk factors Q(p_i , j), with all other risk factors held constant
- Q(p_i,j) the subset of risk factors whose liquidity horizons for the desk where p_i is booked are at least as long as LH_j according to the table below

j	1	2	3	4	5
LH_j	10	20	40	60	120

- ES, floored at 1, must be calibrated to a period of stress on an 'indirect' approach using a reduced set of risk factors (which must at a minimum explain 75% of the variation of the full ES model)

$$ES = ES_{R,S} \cdot \frac{ES_{F,C}}{ES_{R,C}}$$

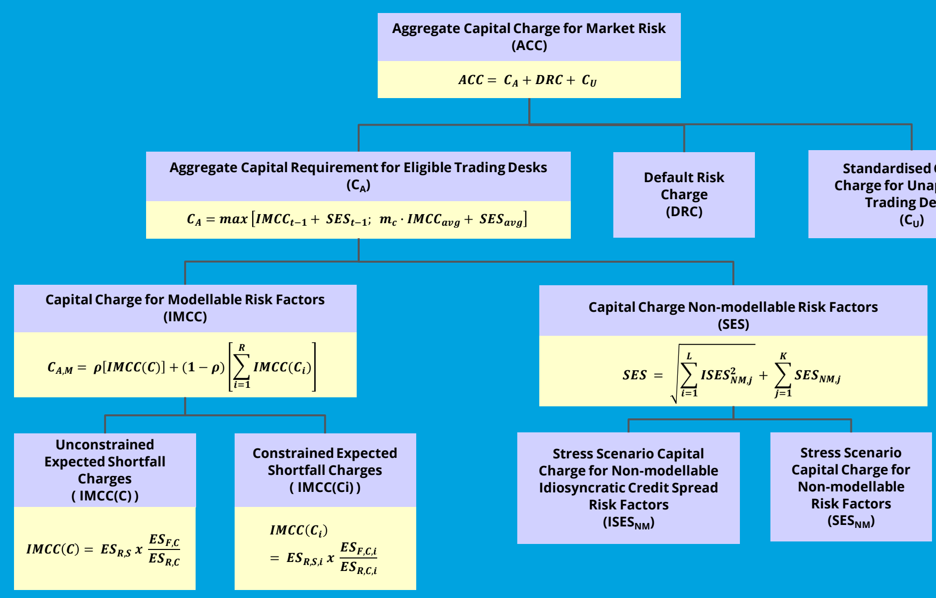
where:
- $ES_{R,S}$ is the ES based on a stressed observation period using a reduced set of risk factors
- $ES_{F,C}$ is the ES based on the most recent 12-month observation period with a full set of risk factors
- $ES_{R,C}$ is the ES based on the current period with a reduced set of risk factors

P&L Attribution Testing

A trading desk does not experience a breach if:

- $-10\% < \frac{Mean\ Unexplained\ Daily\ P\&L}{Standard\ Deviation\ of\ Hypothetical\ Daily\ P\&L} < 10\%$ and
- $\frac{Variances\ of\ Unexplained\ Daily\ P\&L}{Hypothetical\ Daily\ P\&L} < 20\%$

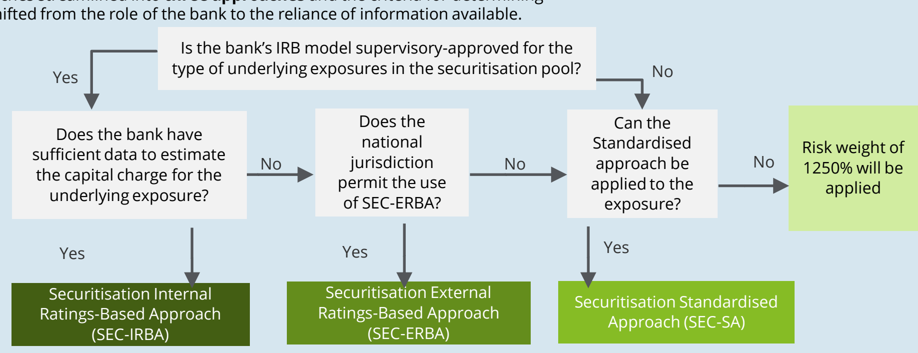
If the desk experiences four or more breaches within the prior 12 months then it must be capitalised under the SA.



Securitisation Framework

Revised Hierarchy of Approaches

Multiple approaches streamlined into **three approaches** and the criteria for determining the approach shifted from the role of the bank to the reliance of information available.



Expanded Set of Simple, Transparent and Comparable (STC) Criteria

Asset Risk

- Nature of assets
- Asset performance history
- Payment status
- Consistency of underwriting
- Asset selection and transfer
- Initial and ongoing data

Fiduciary and Servicer Risk

- Fiduciary and contractual responsibilities
- Transparency to investors

Additional criteria for capital purposes

- Credit risk of underlying exposures
- Granularity of the pool

Structural Risk

- Redemption cash flows
- Currency and interest rate asset and liability mismatches
- Payment priorities and observability
- Voting and enforcement rights
- Documentation disclosure and legal review
- Alignment of interests

Securitisation Framework

Securitisation Internal Ratings-Based Approach (SEC-IRBA)

1. Compute the IRB capital charge of the underlying pool, K_{IRB}.

$$K_{IRB} = \frac{IRB\ capital\ requirement\ for\ the\ underlying\ exposures\ in\ the\ pool}{Exposure\ amount\ of\ the\ pool}$$

2. Compute the tranche attachment point, A.

$$A = \max\left[0, 1 - \frac{Outstanding\ balance\ of\ all\ tranches\ that\ rank\ senior\ or\ pari\ passu\ to\ the\ tranche\ that\ contains\ the\ securitisation\ exposure\ of\ the\ bank}{Outstanding\ balance\ of\ all\ underlying\ assets\ in\ the\ securitisation}\right]$$

3. Compute the tranche detachment point, D.

$$D = \max\left[0, 1 - \frac{Outstanding\ balance\ of\ all\ tranches\ that\ rank\ senior\ to\ the\ tranche\ that\ contains\ the\ securitisation\ exposure\ of\ the\ bank}{Outstanding\ balance\ of\ all\ underlying\ assets\ in\ the\ securitisation}\right]$$

4. Calculate the effective number of exposures, N.

$$N = \frac{(\sum_i EAD_i)^2}{\sum_i EAD_i^2}$$ where EAD_i represents the EAD associated with the i^{th} instrument in the pool

5. Calculate the exposure-weighted average LGD.

$$LGD = \frac{\sum_i LGD_i \cdot EAD_i}{\sum_i EAD_i}$$ where LGD_i represents the average LGD associated with all exposures to the i^{th} obligor

6. Compute the supervisory parameter, p.

(i) For Non-STC compliant securitisation:

$$p = \max\left[0.3, \left(A + B \cdot \frac{1}{N} + C \cdot K_{IRB} + D \cdot LGD + E \cdot M_T\right)\right]$$

where M_T is the tranche's maturity and parameters A, B, C, D, and E are determined according to the look-up table

(ii) For STC compliant securitisation:

$$p = \max\left[0.3,\ 0.5\left(A + B \cdot \frac{1}{N} + C \cdot K_{IRB} + D \cdot LGD + E \cdot M_T\right)\right]$$

where M_T is the tranche's maturity and parameters A, B, C, D, and E are determined according to the look-up table

Tranches		A	B	C	D	E
Wholesale	Senior, granular (N ≥ 25)	0	3.56	–1.85	0.55	0.07
	Senior, non-granular (N < 25)	0.11	2.61	–2.91	0.68	0.07
	Non-senior, granular (N ≥ 25)	0.16	2.87	–1.03	0.21	0.07
	Non-senior, non-granular (N < 25)	0.22	2.35	–2.46	0.48	0.07
Retail	Senior	0	0	–7.48	0.71	0.24
	Non-senior	0	0	–5.78	0.55	0.27

7. Compute the capital requirement per unit of securitisation exposure, $K_{SSFA\,(K_{IRB})}$.

$$K_{SSFA\,(K_{IRB})} = \frac{e^{a \cdot u} - e^{a \cdot l}}{a(u-l)}$$ where $a = \frac{-1}{p \cdot K_{IRB}}$, $u = D - K_{IRB}$, $l = max[A - K_{IRB}; 0]$

8. The risk weight (RW) assigned to a securitisation exposure is subject to a floor of 15% for non-STC compliant securitisation and 10% for senior tranches and 15% for non-senior tranches for STC compliant securitisation. RW is computed in the following ways.

(i) If $D \geq K_{IRB}$, RW = 1250%

(ii) If $A \geq K_{IRB}$, RW = 12.5 x $K_{SSFA\,(K_{IRB})}$

(iii) If $A < K_{IRB}$ and $D > K_{IRB}$, RW = $\left[\left(\frac{K_{IRB} - A}{D - A}\right) \cdot 12.5\right] + \left[\left(\frac{D - K_{IRB}}{D - A}\right) \cdot 12.5 \cdot K_{SSFA\,(K_{IRB})}\right]$

Securitisation External Ratings-Based Approach (SEC-ERBA)

1. Risk weight, subject to a floor of 15% % for non-STC compliant securitisation and 10% for senior tranches and 15% for non-senior tranches for STC compliant securitisation, is determined by exposures' rating:

(i) With short term rating:

External credit assessment	A–1/P–1	A–2/P–2	A–3/P–3	All other ratings
Risk weight	15%	50%	100%	1250%

(ii) With long-term rating:

$$RW = [RW\ from\ table\ below\ after\ adjusting\ for\ maturity] \cdot [\,1 - \min(D - A\,; 50\%)\,]$$

Rating			AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-	CCC+/CCC/CCC-	Below CCC-
Senior Tranche	Tranche Maturity (M_T)	1 year	15%	15%	25%	30%	40%	50%	60%	75%	90%	120%	140%	160%	200%	250%	310%	380%	460%	1250%
		5 years	20%	30%	40%	45%	50%	65%	70%	90%	105%	140%	160%	180%	225%	280%	340%	420%	505%	1250%
Non-senior Tranche	Tranche Maturity (M_T)	1 year	15%	15%	30%	40%	60%	80%	120%	170%	220%	330%	470%	620%	750%	900%	1050%	1130%	1250%	1250%
		5 years	70%	90%	120%	140%	160%	180%	210%	260%	310%	420%	580%	760%	860%	950%	1050%	1130%	1250%	1250%

2. Subject to supervisory approval, a bank may use the Internal Assessment Approach for its Asset-backed Commercial Paper (ABCP) programmes provided that the bank has at least one approved IRB model and if the bank's internal assessment process meets the operational requirements.

Securitisation Standardised Approach (SEC-SA)

1. Compute the weighted-average capital charge of the entire portfolio of underlying exposures, K_{SA}, calculated using the risk-weighted asset amounts in the SA in relation to the sum of the exposure amounts of underlying exposures, multiplied by 8%.

2. Compute variable W.

$$W = \frac{Sum\ of\ the\ nominal\ amount\ of\ delinquent\ underlying\ exposures}{Nominal\ amount\ of\ underlying\ exposures}$$

3. Compute securitisation exposure, K_A.

(i) When delinquency is known:

$$K_A = (1 - W) \cdot K_{SA} + 0.5W$$

(ii) When delinquency status of no more than 5% of underlying exposures in the pool is unknown:

$$K_A = \left(\frac{EAD_{Subpool\ 1\ where\ W\ known}}{EAD\ Total}\ x\ K_A^{Subpool\ 1\ where\ W\ known}\right) + \frac{EAD_{\ Subpool\ 2\ where\ W\ unknown}}{EAD\ Total}$$

4. Compute the capital requirement per unit of the securitisation exposure, $K_{SSFA\,(K_A)}$, where p = 1 for non-STC compliant securitisation and p = 0.5 for STC compliant securitisation.

$$K_{SSFA\,(K_A)} = \frac{e^{a \cdot u} - e^{a \cdot l}}{a(u-l)}$$ where $a = \frac{-1}{p \cdot K_A}$, $u = D - K_A$, $l = max[A - K_A; 0]$

5. The risk weight (RW) assigned to a securitisation exposure is subject to a floor of 15% for non-STC compliant securitisation and 10% for senior tranches and 15% for non-senior tranches for STC compliant securitisation. RW is computed in the following ways.

(i) If $D \leq K_A$, RW = 1250%

(ii) If $A \geq K_A$, RW = 12.5 x $K_{SSFA\,(K_A)}$

(iii) If $A < K_A$ and $D > K_A$, RW = $\left[\left(\frac{K_A - A}{D - A}\right) \cdot 12.5\right] + \left[\left(\frac{D - K_A}{D - A}\right) \cdot 12.5 \cdot K_{SSFA\,(K_A)}\right]$

(iv) Delinquency status of more than 5% of underlying exposures in the pool is unknown, RW = 1250%

Credit Valuation Adjustment (CVA)

Basic Approach (BA-CVA)

Reduced Version of the BA-CVA

The reduced version, simplified for less sophisticated banks from the full version via elimination of hedging recognition, forms part of the full BA-CVA capital calculations.

1. Compute the supervisory discount factor for each netting set (DF_{NS}) if banks are not using the Internal Model Method (IMM) to calculate EAD. For banks on IMM, DF_{NS} is 1.

$$DF_{NS} = \frac{1 - e^{-0.05 \cdot M_{NS}}}{0.05 \cdot M_{NS}}$$

where M_{NS} is the effective maturity for the netting set (NS)

2. Determine supervisory risk weights (RW_C) of counterparty via its sector and credit quality which can be Investment Grade (IG), High Yield (HY), or Not Rated (NR). The supervisory risk weights are also used in the full version of the BA-CVA for single-name and index hedges.

Sector	Credit Quality	
	IG	HY & NR
Sovereigns including central banks and MDBs	0.5%	3.0%
Local government, government-backed non-financials, education and public administration	1.0%	4.0%
Financials including government-backed financials	5.0%	12.0%
Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying	3.0%	7.0%
Consumer goods and services, transportation and storage, administrative and support service activities	3.0%	8.5%
Technology, telecommunications	2.0%	5.5%
Health care, utilities, professional and technical activities	1.5%	5.0%
Other sector	5.0%	12.0%

3. Compute the stand-alone CVA capital ($SCVA_c$) of counterparty

$$SCVA_C = \frac{1}{\alpha} \cdot RW_C \cdot \sum_{NS} [M_{NS} \cdot EAD_{NS} \cdot DF_{NS}]$$

where: α is 1.4
EAD_{NS} is the EAD of the NS

4. Compute capital requirement ($K_{reduced}$)

$$K_{reduced} = \sqrt{(\rho \cdot \sum_C SCVA_C)^2 + (1 - \rho^2) \cdot \sum_C SCVA_C^2}$$

where ρ is 50%

Full Version of the BA-CVA

1. Compute the supervisory discount factor for each single-name hedge (DF_h^{SN})

$$DF_h^{SN} = \frac{1 - e^{-0.05 \cdot M_h^{SN}}}{0.05 \cdot M_h^{SN}}$$ where M_h^{SN} is the remaining maturity of a single-name hedge

2. Determine supervisory risk weights (RW_C) of single name hedge.

3. Determine supervisory prescribed correlation (r_{hc}) between the credit spread of counterparty and the credit spread of a single-name hedge of counterparty.

Single-name hedge of counterparty	Value of r_{hc}
references counterparty directly	100%
has legal relation with counterparty	80%
shares sector and region with counterparty	50%

4. Compute the reduction in CVA risk arising from the use of single-name credit spread risk hedges (SNH_C).

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

where B_h^{SN} is the notional of a single-name hedge

5. Compute the supervisory discount factor for each index hedge (DF_i^{ind}).

$$DF_i^{ind} = \frac{1 - e^{-0.05 \cdot M_i^{ind}}}{0.05 \cdot M_i^{ind}}$$ where M_i^{ind} is the remaining maturity of an index hedge

6. Determine supervisory risk weights (RW_i) of index hedge. Relevant risk weight are to be multiplied by 0.7 to account for diversification of idiosyncratic risk within the index or for indices spanning multiple sectors or with a mixture of investment grade constituents and other constituents.

7. Compute the reduction in CVA risk arising from the use index hedges (IH).

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

where B_i^{ind} is the notional of an index hedge

8. Compute the hedging misalignment parameter (HMA_C).

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

9. Compute capital requirements that recognises eligible hedges (K_{hedged}).

$$K_{hedged} = \sqrt{[\rho \cdot \sum_C (SCVA_c - SNH_C) - IH]^2 + (1 - \rho^2) \sum_C (SCVA_C - SNH_C)^2 + \sum_C HMA_C}$$

where ρ is 50%

10. Compute total capital requirement (K_{full}).

$$K_{full} = \beta \cdot K_{reduced} + (1 - \beta) \cdot K_{hedged}$$ where β is 0.25

Standardised Approach (SA-CVA)

The SA-CVA capital requirement is calculated as the sum of the capital requirements for delta and vega risks, calculated via the same procedure, for the entire CVA portfolio (including eligible hedges).

1. Calculate sensitivity of the aggregate CVA (s_k^{CVA}) and sensitivity of the market value of all eligible hedging instruments in the CVA portfolio (s_k^{Hdg}) for each risk factor k.

2. Obtain the weighted sensitivities (WS_k^{CVA}, WS_k^{Hdg}) and compute the net weighted sensitivity of the CVA portfolio (WS_k).

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

where RW_k is the risk weight applicable for each risk type

3. Compute capital charge within each bucket b.

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

where: R is 0.01
ρ_{kl} is the correlation parameter

4. Compute capital charge for each risk type.

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

where: m_{CVA} is 1.25
γ_{bc} is the correlation parameter

Materiality Threshold

Banks that have an aggregate notional amount of non-centrally cleared derivatives less than or equal to €100 billion may choose to set it's CVA capital equal to 100% of the bank's capital requirement for Counterparty Credit Risk.

Leverage Ratio Framework

Refinements to the Leverage Ratio (LR) Exposure Measure

$$\text{Leverage Ratio} = \frac{\text{Tier 1 Capital}}{\text{Exposure Measure}} \geq 3\%$$

The LR will restrict the accumulation of leverage that amplifies downward pressure on asset prices as banks rush to deleverage in times of financial crisis and strengthen the risk based capital requirements as a backstop measure.

National discretion may be exercised, in exceptional macroeconomic circumstances, to exempt central bank reserves from the leverage ratio exposure measure on a temporary basis. Employment of such discretion would require the commensurate recalibration of the minimum leverage ratio requirement to offset the impact as well as disclosures of the impact.

Various refinements were made affecting the treatment for the following exposures (in which the total is the denominator of the LR) and the main revisions are:

1. On-balance sheet
   - For unsettled trades accounted for under trade date accounting, cash payables and receivables of such trades may be offset subject to qualifying conditions.
   - Cash pooling, where balances of individual accounts are combined into a single account balance, are allowed provided that requirements are met.
2. Derivative
   - Exposures are measured by summing Replacement Cost (RC) and Potential Future Exposure (PFE) and multiplying the sum with a scalar multiplier (set at 1.4).
   - For treatment of clearing services, bank as "higher level client" within a multi-level client structure may exclude resulting trade exposures to the clearing member (CM) subject to clearing certain conditions.
3. Securities financing transaction (SFT)
   - The existing criteria for the netting of cash receivables and payables have been expounded upon.
   - In measuring Counterparty Credit Risk (CCR), the terms "counterparty" includes the counterparty of bilateral repo transactions and triparty repo agents.
4. Off-balance sheet (OBS) items
   - Credit Conversion Factors (CCF) will be based on Basel framework's revised standardised approach for credit risk, subject to a floor of 10%.

Introduction of Leverage Ratio Buffer for Global Systemically Important Banks (G-SIBs)

G-SIB Leverage Ratio Requirement ≥ 3% Minimum Requirement + Leverage Ratio Buffer

Leverage Ratio Buffer

The **leverage ratio buffer** seeks to mitigate externalities created by G-SIBs and is in line with the risk-weighted G-SIB buffer. The leverage ratio buffer is **50%** of a particular G-SIBs' **Higher-Loss Absorbency (HLA) requirement**. However, jurisdictions may impose a higher leverage ratio buffer requirement.

Bucket	HLA requirement	Leverage Ratio Buffer
1	+1.0% CET1	+0.50%
2	+1.5% CET1	+0.75%
3	+2.0% CET1	+1.00%
4	+2.5% CET1	+1.25%
5	+3.5% CET1	+1.75%

G-SIBs' Minimum Capital Conservation Standards

- A G-SIB that meets both its **CET1 risk-weighted requirements** and **Tier 1 leverage ratio requirement** will not be subjected to distribution constrains.
- CET1 risk-weighted requirements comprises of a 4.5% minimum requirement, 2.5% capital conservation buffer, HLA requirement and countercyclical capital buffer (if applicable) while Tier 1 leverage ratio requirement comprises of a 3% leverage ratio minimum requirement and the leverage ratio buffer.
- The minimum capital conservation ratios for different HLA requirements, *h*, are tabled as follows.

CET1 Risk Weighted Ratio	Tier 1 Leverage Ratio	Minimum Capital Conservation Ratios
CET1 > [7% + h]	LR > [3% + $\frac{h}{2}$]	0%
[6.375% + $\frac{3h}{4}$] < CET1 ≤ [7% + h]	[3% + $\frac{3h}{8}$] < LR ≤ [3% + $\frac{h}{2}$]	40%
[5.75% + $\frac{h}{2}$] < CET1 ≤ [6.375% + $\frac{3h}{4}$]	[3% + $\frac{h}{4}$] < LR ≤ [3% + $\frac{3h}{8}$]	60%
[5.125% + $\frac{h}{4}$] < CET1 ≤ [5.75% + $\frac{h}{2}$]	[3% + $\frac{h}{8}$] < LR ≤ [3% + $\frac{h}{4}$]	80%
4.5% < CET1 ≤ [5.125% + $\frac{h}{4}$]	3% < LR ≤ [3% + $\frac{h}{8}$]	100%

- If the G-SIB **does not meet one of these requirements**, it will be subject to the associated minimum capital conservation requirement (expressed as a percentage of earnings).
- If the G-SIB **does not meet both requirements**, it will be subject to the higher of the two associated conservation requirements.

Output Floor

The revised floor places a limit on the regulatory capital benefits that a bank using internal models can derive relative to the standardised approaches. This serves to provide a risk-based backstop, limiting the extent banks can lower their capital requirement, as well as support the credibility of banks' risk-weighted calculations and improve comparability via the related disclosures.

Computation of Risk Weighted Assets (RWA)

Banks are to calculate their RWA as the higher of

(a) total RWA calculated under the approaches approved by their regulator; and

(b) 72.5% of the total RWA calculated using the standardised approaches.

The standardised approaches by risk type	
Credit Risk	SA
Counterparty Credit Risk	SA-CCR
Credit Valuation Adjustment Risk	SA-CVA, BA–CVA or 100% of the bank's counterparty credit risk capital requirement
Securitisation Framework	SEC-SA, SEC-ERBA or 1250% risk weight
Market Risk	SA or Simplified SA
Operational Risk	SMA

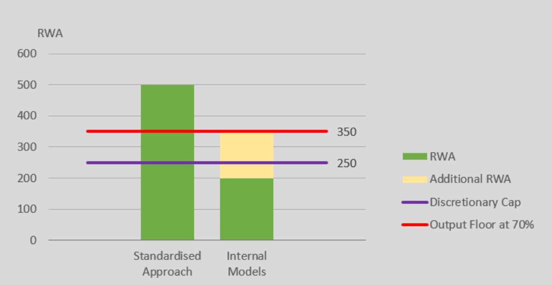
Transition Arrangements

Transitional arrangements are to ensure an orderly and timely implementation by jurisdictions and adjustment by banks. The implementation dates are summarised in the table below.

Transitional arrangement for phasing in the aggregate output floor	
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%

Output Floor at Work

- Subject to national discretion, regulators may cap the increase in total RWA at 25% of the bank's RWA before application of the output floor during the transition period. Effectively, the bank's RWA will be capped at 1.25 times the internally calculated RWAs.
- The chart on the right illustrates the effect of the revised output floor and the discretionary capping will have on the computation of a bank's RWA. This example assumes that a bank has an RWA of 500 million computed via standard approaches and 200 million via internal models for Year 2026.
- Without discretionary capping, the bank's RWA would be at 350 million (500 million x 70%) for Year 2026. Thus, the additional RWA due to the output floor is 150 million.
- With discretionary capping applied, the bank's RWA would be at 250 million (200 million x 1.25 times). The additional RWA, attributable to the cap, is 50 million.



Operational Risk Framework

New Standardised Measurement Approach (SMA)

The new Standardised Measurement Approach (SMA), a risk-sensitive standardised approach based on a bank's income and historical losses, replaces the Advanced Measurement Approach (AMA), Basic Indicator Approach (BIA), The Standardised Approach (TSA) and Alternative Standardised Approach (ASA). Regulators retain the discretion to apply SMA to non-internationally active banks.

The Operational Risk Capital (ORC) is defined as the product of the Business Indicator Component (BIC), which itself is the product of the Business Indicator (BI) and its marginal coefficient (α_i), and Internal Loss Multiplier (ILM).

$$ORC = BIC \; x \; ILM = \sum_i \alpha_i BI_i \; x \; ILM$$

Operational Risk Capital (ORC)

Business Indicator Component (BIC)

Business Indicator (BI)

The BI is the sum of the Interest, Leases And Dividend Component (ILDC), the Services Component (SC) and the Financial Component (FC).

$$\boldsymbol{BI = ILDC + SC + FC}$$

The terms in the individual components of BI are calculated as the average over three years and is indicated by a bar in the following formula.

$$ILDC = Min\left[\overline{Abs\begin{pmatrix}Interest \\ Income\end{pmatrix} - \begin{matrix}Interest \\ Income\end{matrix}}, 2.25\% \; x \; \overline{\begin{pmatrix}Interest \\ Earning \\ Income\end{pmatrix}}\right] + \overline{\begin{pmatrix}Dividend \\ Income\end{pmatrix}}$$

$$SC = Max\left[\overline{\begin{pmatrix}Other \\ Operating \\ Income\end{pmatrix}}, \overline{\begin{pmatrix}Other \\ Operating \\ Expense\end{pmatrix}}\right] + Max\left[\overline{\begin{pmatrix}Fee \\ Income\end{pmatrix}}, \overline{\begin{pmatrix}Fee \\ Expense\end{pmatrix}}\right]$$

$$FC = \overline{Abs\begin{pmatrix}Net\ P\&L \\ Trading \\ Book\end{pmatrix}} + \overline{Abs\begin{pmatrix}Net\ P\&L \\ Banking \\ Book\end{pmatrix}}$$

Marginal BI Coefficients (α_i)

The marginal coefficients increase with the size of BI.

Bucket	BI (€ billion)	α_i
1	≤ 1	0.12
2	1 < BI ≤ 30	0.15
3	> 30	0.18

Internal Loss Multiplier (ILM)

- Operation risk loss experiences affect the computation of ORC via the ILM through the Loss Component (LC).

$$ILM = \ln\left[e^1 - 1 + \left(\frac{LC}{BIC}^{0.8}\right)\right]$$

- The LC is equals to 15 times the average annual operational risk losses incurred over the previous 10 years.
- The relationship between LC and BIC, summarised below, is inversely related.

LC < BIC	ILM ≤ 1, lower operational risk capital required.
LC = BIC	ILM = 1, operational risk capital is equal to BIC.
LC > BIC	ILM ≥ 1, higher operational risk capital required as internal losses are incorporated into the calculation methodology.

- Banks in Bucket 1 have an ILM of 1. Regulators have a discretion of setting an ILM of 1 for all banks in their jurisdiction.

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Asian Institute of Chartered Bankers (AICB) has been championing the vision of professionalising bankers since 1977 by upholding the standards of excellence for the financial services sector to empower its workforce through the systematic transfer of knowledge and qualifications.

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