Basel IV Update: SA and IRB

Final Changes to the Standardised Approach and Internal Ratings Based Approach of the Credit Risk Framework

The Hong Kong Monetary Authority (HKMA) has adopted many of the changes proposed in the Basel III reform package, "The Banking (Capital) (Amendment) Rules 2023," and is close to finalising its localisation. The rules were tabled to the Hong Kong SAR Legislative Council in January 2024 and are expected **to take effect on 1 January 2025**.

Basel IV, also referred to as the final stages of Basel III, will introduce a number of significant changes to the current regime. Banks and other financial institutions should ensure they are ready for the transition.

The Basel III reform package, introduced in 2017, included revisions to the standardised approach (SA) and internal ratings-based approach (IRB) of the credit risk framework. The changes were part of a broader regulatory reform initiative to reduce the variability of risk-weighted assets (RWA) which could affect the comparability of the capital adequacy ratios estimated among banks.

Key changes to SA and IRB:

- **SA:** A more granular exposure classification, a more risk-sensitive measurement, less reliance on external credit rating, and a more granular approach for unrated exposures
- **IRB:** Limited usage of IRB for certain types of exposures, application of floors on modelled parameters, and new specifications on risk parameter estimations for remaining IRB exposures

An aggregate floor on RWA calculated under IRB will range from 50% to 72.5% of that calculated under SA, with a phase-in period of five years with the following proposed implementation dates.

Proposed Implementation Dates	1 Jan 2025	1 Jan 2026	1 Jan 2027	1 Jan 2028	1 Jan 2029	1 Jan 2030
Output Floor Level	50%	55%	60%	65%	70%	72.5%

> *"Given the number of credit risk challenges that AIs are grappling with, combined with the new Basel IV reform implementation deadlines, it is critical that AIs start now to holistically assess the RWA impacts."*
>
> ***– Michael Monteforte, Partner, Financial Risk Management Advisory***

Key Updates and Changes

New standardised approach (SA)

Standardised Floor

Standardised floor to limit the benefits of internal models

- Banks' capital requirements will be floored to a certain percentage of the standardised requirement, and this will be phased in.
- All banks (including IRB banks) will need to implement the new standardised approach, which enhances the comparability of RWA across the Banks

Revised Risk Weights

More granular and risk sensitive exposure classification

- There have been several changes in the risk weights for certain exposure classifications, which provide a more risk sensitive RWA estimation
- In particular, there is increased sensitivity for exposures secured by real estate, with greater emphasis placed on the loan-to-value ratios as the driver of the risk weight

Due Diligence Requirements

Due diligence procedure in place

- The bank must perform due diligence on its credit exposures (at origination and at least annually thereafter) to ensure that it has an adequate understanding of the risk profile and characteristics of the obligors with respect to the exposures
- The HKMA considers that to fulfill the due diligence requirement, the Banks need to —
  - i. develop a mapping scheme that maps their credit assessment result to an equivalent external credit rating; and
  - ii. compare the outcome of their internal credit assessment and the risk weight determined based on the external credit rating assigned to the exposure

New internal ratings-based approach (IRB)

Limitation on IRB Approaches

For difficult to model for low default portfolios (eg large corporations, financial institutions)

- This limitation still allows banks to continue using IRB for major portfolios while estimates of RWA using IRB should be more reliable
- We see this as a positive action as it removes the difficulties Banks have had with identifying a robust methodology to develop models for low/zero default portfolios

Higher Floors

Higher floors for risk parameters (probability of default (PD), loss given default (LGD) and exposure at default (EAD))

- Floors range from 5bps to 10bps for PD, and between 0% to 50% for LGD, 50% of off-balance sheet exposure for EAD estimation plus all on-balance sheet exposure
- We also see this as a positive development to increase the reliability of the IRB estimates and make the estimates more prudential

Enhanced Credit Risk Mitigation Measures

Expanded scope of CRM with clarification on measurements

- The scope of eligible credit risk mitigation instruments further expanded
- Clearer standards specified for the default loss rate and discount factor for eligible financial collateral
- Further clarification provided regarding the measurement of risk mitigation effectiveness

Basel IV HKMA: New SA Parameters

Basel IV Classes	Basel II RW	Key Drivers	Basel IV New RW	New Key Drivers
Banks	• 20-150%	• Sovereign's credit risk rating • External credit ratings • Original maturity	• ECRA: 20-150% • SCRA: 20-150%	• External credit risk assessment approach • Standard credit risk assessment approach • Cross-border movement of goods
Covered Bonds	• N/A	• N/A	• Issue specific rating/ issuer rating: 10%-100% • Unrated: 20%-150% (risk weight of issuing bank)	• External issue / issuer rating based on ECRA / SCRA risk weight
Corporates	• 20-150%	• External credit ratings (100% for unrated)	• Rated: 20-150% • Unrated: 85-100% • Specialised lending: 80% - 150%	• Annual sales for SME categorization • Specialized lending characteristics
Commercial Real Estate	• N/A	• N/A	• LTV≤60%: Min (60%, risk weight of counterparty) • LTV>60%: Risk weight of counterparty	• Original LTV% • Counterparty risk weights • Reliance on cash flow generated from collateral
ADC	• N/A	• N/A	• 100-150%	• Borrower-contributed equity to the property's appraised as-completed value
Retail	• 75-100%	• Obligor type • Maximum aggregate exposure • Product type	• Transactor: 45% • Regulatory retail: 75% • Other retail: 100% • Currency mismatch: 1.5x multiplier	• Repayment behavioral • New change for regulatory retail is the 0.2% factor for retail portfolio to single counterparty exposures • Borrower's income currency
Residential Real Estate	• 35-100%	• Regulatory category	• LTV≤50%: 20-30% • 50%<LTV ≤60%: 25-35% • ... • LTV>100%: 70-105%	• Original LTV % • Reliance on cash flow generated from collateral • Currency mismatch also applies
Equity	• 100-250%	• Capital equity and instruments	• 150-1,250%	• Type (e.g. unlisted, listed) • Significance of LAC investment
Multilateral Development Banks	• 0-150%	• MDB's external credit rating	• 0 - 150%	• Eligibility criteria of MDB is new and still relies on external credit rating
Off-balance sheet	• 0-100% CCF, where: - UCC: 0% - CCC: 20-50%	• Type of commitment (UCC or CCC) • Original maturity of commitment	• 0-100% CCF, where: - Exempted commitment: 0% - UCC: 10% - CCC: 40%	• Exemption criteria for 0% CCF • Removed original maturity of commitment as driver

* Note: ADC: Land Acquisition, Development and Construction, UCC: unconditionally cancellable commitment, CCC: conditionally cancellable commitment, LAC: Loss absorbing capacity

Illustrative Impacts on SA RWA Density

Letter of Credit Issued By BBB- to BBB+ Bank

	EAD	RW%		RWA $mn	Change in RWA Density %
Current	$1 bn	50%	→	$500 mn	
Proposed	$1 bn	20%	→	$200 mn	-60% ↓

1. Assumption: the original maturity of the trade finance guaranteed by the Bank is less than 6 months
2. Assumption: the letter of credit are for cross movement of goods

Small Business Unsecured Lending

	EAD	RW%		RWA	Change in RWA Density %
Current	$1 bn	100%	→	RWA $bn: $1 bn	
Proposed	$1 bn	85%	→	RWA $mn: $850 mn	-15% ↓

1. Assumption: a corporate (or in a consolidated group) with annual sales not exceeding HKD $500 million for the most recent financial year
2. Assumption: the maximum aggregate exposure of the institution to that single obligor, or to that group of obligors, exceed HKD $10 million so it does not fall under regulatory retail exposure

Specialized Lending

	EAD	RW%		RWA $bn	Change in RWA Density %
Current	$1 bn	100%	→	$1 bn	
Proposed	$1 bn	130%	→	$1.3 bn	+30% ↑

1. Assumption: The lending is provided to a special purpose vehicle that is established by the institution for the sole purpose of raising capital for the institution; and does not trade or conduct any business except raising capital for the institution
2. Assumption: The project which is under financing is under preoperational phase

Personal Credit Card *(Transactor)*

	EAD	RW%		RWA $	Change in RWA Density %
Current	$5.5 k	75%	→	$4,125	
Proposed	$4.6 k	45%	→	$2,070	-50% ↓

1. Assumption: There are no balance due or repaid in full the balance due under the facility at each scheduled repayment date for the previous 12 months
2. Assumption: The total limit of personal credit card is $10k, and only $1k is utilized

Personal Revolving Loan with Currency Mismatch

	EAD	RW%		RWA	Change in RWA Density %
Current	$1 mn	75%	→	RWA $k: $750 k	
Proposed	$1 mn	112.5%	→	RWA $mn: $1.125 mn	+50% ↑

1. Assumption: The borrower's source of income is HKD and the lending currency is AUD, which exposed to currency mismatch
2. Assumption: The borrow is non-transactor while fulfills the regulatory retail exposure.

Residential Mortgage

	EAD	RW%		RWA $mn	Change in RWA Density %
Current	$5 mn	35%	→	$3.5 mn	
Proposed (non-IPRE)	$5 mn	20%	→	$2 mn	-43% ↓
Proposed (IPRE)	$5 mn	30%	→	$3 mn	-14% ↓

1. Assumption: The original LTV is 50%
2. Assumption: There are no currency mismatch
3. IPRE definition: The repayments are materially dependent on cash flows generated by the property secured

Loan Secured by Commercial Property

	EAD	RW%		RWA	Change in RWA Density %
Current	$1 bn	100%	→	RWA $bn: $1 bn	
Proposed	$1 bn	60%	→	RWA $mn: $600 mn	-40% ↓

1. Assumption: The original LTV is 50%

New Treatment for IRB Exposures

HKMA restricted uses on IRB approaches

The HKMA prohibits the use of the *advanced IRB* (AIRB) approach in respect of exposures to banks, other financial institutions and large corporates with consolidated annual revenue greater than HKD 5,000 million; and requires such portfolios be migrated to the *foundation IRB* (FIRB) approach. It further requires that the equity exposures of IRB banks must be subject to the revised SA for credit risk. The revised approach reduces the credit risk RWA variation between SA and IRB banks.

Exposure Classes	HKMA Basel II Allowed Approaches	HKMA Basel IV Allowed Approaches
Large corporates (annual revenue > HKD 5,000 mn)	• Advanced-IRB • Foundation-IRB • Standardised approach	• Foundation-IRB • Standardised approach
Banks and other financial institutions	• Advanced-IRB • Foundation-IRB • Standardised approach	• Foundation-IRB • Standardised approach
Equities	• Advanced-IRB • Foundation-IRB • Standardised approach	• Standardised approach

> ***"Difficult to model and low default portfolios previously allowed to use AIRB approaches (large corporates, banks and equities) will all move to the FIRB or the new standardised approach."***

Floor applied on IRB risk parameters

The HKMA has applied floors on IRB risk parameters, including PD, EAD, LGD. These changes further limit the advantages of IRB banks on capital estimation and reduce the RWA variability of risk-weighted assets.

<table>
<tr><th>Exposure Classes</th><th>PD</th><th>EAD</th><th>LGD (secured)</th><th>LGD (unsecured)</th></tr>
<tr><td>Corporate</td><td>0.05%</td><td>Sum of (i) the on-balance sheet exposures; and (ii) 50% of the off-balance sheet exposure using the CCF in SA</td><td rowspan="2">Financial collateral: 0%
Financial receivables: 10%
Commercial real estate or residential real estate: 10%
Other physical: 15%</td><td>25%</td></tr>
<tr><td>Retail – Other</td><td>0.05%</td><td>N/A</td><td>30%</td></tr>
<tr><td>Retail Mortgages</td><td>0.05%</td><td>N/A</td><td>5%</td><td>N/A</td></tr>
<tr><td>Retail – QRRE transactors</td><td>0.05%</td><td>N/A</td><td>N/A</td><td>50%</td></tr>
<tr><td>Retail – QRRE revolvers</td><td>0.10%</td><td>N/A</td><td>N/A</td><td>50%</td></tr>
</table>

New Parameter Estimation for IRB

PD Proposed Parameterisation Changes

All IRB Exposures

ANEW REQUIREMENTS

- New requirements on the stability of internal ratings derived from PD, namely they should remain stable through the business cycle
- Data used to estimate PD should include mix of 'good' and 'bad' years with minimum weighting of downturn years of 1 in 10
- At a minimum each rating grade must have an estimated PD
- Remove 'Seasoning' in the adjustment or calibration and include as a risk factors into the PD model

LGD Proposed Parameterisation Changes

Corporates FIRB - Unsecured

UPDATED UNSECURED LGD FOR SENIOR EXPOSURE

- LGD (u): Senior exposures now 40%
- LGD (u): Subordinated exposures remained unchanged at 75%

Corporates & Retail AIRB - Unsecured

NEW ADD-ON COMPONENT

- LGD will be the sum of long-run average LGD for each exposure plus a downturn LGD add-on
- Downturn add-on is separately modelled and the committee may consider an additional floor; or supervisor specified add-on

Corporates FIRB – Partially or Fully Secured

NEW WEIGHTED AVERAGE LGD CALCULATION

- $\mathrm{LGD} = LGD(u) \times \frac{E(u)}{E \cdot (1+He)} + LGD(s) \times \frac{E(s)}{E \cdot (1+He)}$
- Simpler approach with new haircuts applied to determine downturn LGD (s) for secured exposures
- Increase haircuts for Receivables and CRE/RRE to 50%
- All other haircuts use new SA Approach
- New LGD (s):
  - Eligible Financial Collateral still 0%
  - Receivables now 20%
  - CRE / RRE now 20%
  - Other Physical now 25%
- No more 30% minimum collateralisation requirements
- Grossing-up exposure values extended

Corporates & Retail AIRB - Partially or Fully Secured

NEW WEIGHTED AVERAGE FLOOR CALCULATION

- $Floor = LGD(u\, floor) \times \frac{E(u)}{E} + LGD(s\, floor) \times \frac{E(s)}{E}$
- Banks can still model LGD for fully or partially secured exposures, but a weighted average floor will be applied to internal modelled estimates
- This formula will not apply to mortgage portfolios.
- LGD (u) floor and LGD (s) floor are proposed in the document

Exposure AIRB – Collateral Not Modelled

NEW APPROACH FOR COLLATERAL EFFECT

- For AIRB exposures where unsecured is modelled and collateral not modelled, the committee to apply formula:
- $\mathrm{LGD} = LGD(u) \times \frac{E(u)}{E \cdot (1+He)} + LGD(s) \times \frac{E(s)}{E \cdot (1+He)}$
- LGD (u) is modelled by the bank
- LGD (s) is determined as under the new FIRB approach

EAD Proposed Parameterisation Changes

Exposures FIRB

UPDATED CCF DEFINITIONS

- Use updated CCF definitions in new SA approach

Corporates & Retail AIRB

NEW CONSTRAINTS

- Updated constraints and requirements on modelling EAD/CCF
- Clarifications on the definitions of 'commitment' and 'unconditionally cancellable'

Maturity (M) Proposed Parameterisation Changes

Exposures FIRB

NOT CHANGED

- Remains at the fixed 2.5 year parameter under FIRB

Corporates & Retail AIRB

NEW CONSTRAINTS

- Based on the expiry date of the facility
- Use of repayment date on current drawdown prohibited

Credit Risk Mitigation (CRM) Proposed Parameterisation Changes

Exposures FIRB

ONLY FULL SUBSTITUTION ALLOWED & NEW CONSTRAINTS

- For the covered portion of the exposure the PD of the guarantor replaces PD of the obligor
- Double default approach removed
- No more own estimates for collateral haircuts

Corporates & Retail AIRB

NEW CONSTRAINTS

- 'Conditional Guarantees' are now prohibited
- New definitions on 'Unconditional Guarantees' to remain eligible credit risk mitigants
- Double Default approach removed
- Only first-to-default derivatives will remain eligible

Illustrative Impacts on IRB RWA Density

AIRB Large Corporate Unsecured[1]

	EAD	M	PD	LGD	RWA%	RWA $mn	Change in RWA density %
Current	$1 bn	2.5 Years	.03%[2]	30%[3]	10%	$102 mn	
Proposed (FIRB)	$1 bn	2.5 Years	.05%	40%	17%	$175 mn	+71%
Proposed (SA)	$1 bn				20%[4]	$200 mn	+96%

1. Assumption: Large corporates with annual revenue > HKD 5,000 mn
2. Assumption: internal modeled PD is .03% which based on observed averages of internal modelled PD for HK bank's top two internal rating grades
3. Assumption: internal modeled LGD is 30% which is based on observed averages of internal modelled LGD for HK bank's top two internal rating grades
4. Assumption: counterparty is externally rated AA- by a rating agency and thus the 20% Risk Weight applies as per the New SA CR approach

FIRB Corporate Partially Secured[1]

	EAD	M	PD[2]	LGD	RWA%	RWA $mn	Change in RWA density %
Current	$50 mn	2.5 Years	.03%	45%[3]	15%	$7.7 mn	+4%
Proposed (FIRB)	$50 mn	2.5 Years	.05%	36%[4]	16%	$7.9 mn	

1. Assumption: corporate meets the new threshold requirements to remain on FIRB
2. Assumption: internal modelled PD is .03% for top two internal rating grades, the new PD floor requirement is applied .05%
3. Assumption: minimum post haircut collateralization requirement of 30% under FIRB not met and thus the 40% unsecured LGD is applied
4. Assumption: LGD is calculated using the new proposed weighted average approach, supervisory haircut of 40% is applied on a 15mn CRE eligible collateral

AIRB Corporate Partially Secured[1]

	EAD	M	PD[2]	LGD[3]	RWA%	RWA $mn	Change in RWA density %
Current	$50 mn	2.5 Years	.03%	30.00%	10%	$5.1 mn	+28%
Proposed (FIRB)	$50 mn	2.5 Years	.05%	30.00%	13%	$6.6 mn	

1. Assumption: corporate meets the new threshold requirements to remain on AIRB
2. Assumption: internal modelled PD is .03% for top two internal rating grades, the new PD floor requirement is applied .05%
3. Assumption: Internal modelled LGD is 30% (including downturn requirements), this is higher than the new weighed average LGD floor and thus 30% is applied

AIRB Bank Exposure

	EAD	M[1]	PD	LGD	RWA%	RWA $mn	Change in RWA density %
Current	$50 mn	1.5 Years	.03%[2]	30%[3]	7%	$3.5 mn	
Proposed (FIRB)	$50 mn	2.5 Years	.05%	45%	20%	$9.8 mn	+182%
Proposed (SA)	$50 mn				20%[4]	$10 mn	+187%

1. Assumption: Maturity modelled at 1.5 years and fixed at 2.5 years under FIRB (as AIRB is restricted for bank exposure)
2. Assumption: internal modeled PD is .03% which based on observed averages of internal modelled PD for banks top two internal rating grades
3. Assumption: internal downturn LGD is estimated at 30.00%
4. Assumption: counterparty is externally rated AA- by a rating agency and thus the 20% Risk Weight applies as per the New SA CR approach

IRB Equity Exposure[1]

	EAD	M	PD	LGD	RWA%	RWA $mn	Change in RWA density %
Current	$100 mn	5 Years	2%	90%	311%	$311 mn	
Proposed (SA)	$100 mn				400%[2]	$400 mn	+29%

1. Assumption: PD/LGD approach is adopted which set the M to be 5 years and LGD to be 90%
2. Assumption: The equity is subordinated bond and thus the 400% Risk Weight applies as per the New SA CR approach

How KPMG can help?

1. Basel IV Capital Optimisation Strategy Design

- Conduct a detailed impact analysis on the bank's existing portfolio to analyse the capital impact by exposure classes, product level, and legal entity level
- Capital optimisation recommendations on capital savings, eg data cleansing, RWA calculation approaches, other potential balance sheet and RWA optimisation

2. Basel IV Data Quality and Data Governance Enhancement

- Detailed assessment of data architecture for RWA aggregation data and provide recommendations to strengthen data quality and governance, eg centralised customer database as golden source, data owner assignment, data gap analysis, data remediation
- Enhance policies and procedures on data quality to allow more accurate RWA result calculations and automate data quality monitoring
- Training frontline staff and business functions on key data requirements and importance
- Perform data mapping review for each RWA data related field to ensure that the bank's interpretation fulfils HKMA requirements

3. Automation of RWA Preparation Processes

- Streamline the RWA result preparation process with enhancements in system infrastructure and data mapping solutions
- Support automation of the RWA calculation processes with KPMG tooling or third party solutions in order to speed up results and support more dynamic capital management

4. SA and IRB RWA Validation

- Review the RWA calculations adopted by the bank for both the SA and IRB approach against the regulatory requirements to ensure compliance
- Validate your RWA calculations using a KPMG self-developed tool to verify the accuracy of RWA aggregation under SA and IRB approaches

Contact us

Michael Monteforte
Partner,
Financial Risk Management
KPMG China
+852 2847 5012
michael.monteforte@kpmg.com

Robert Zhao
Partner,
Financial Risk Management
KPMG China
+852 2978 8939
robert.zhao@kpmg.com

Gemini Yang
Partner,
Financial Risk Management
KPMG China
+852 3927 5731
gemini.yang@kpmg.com

Guy Isherwood
Senior Advisor
KPMG China
+852 2522 6022
guy.isherwood@kpmg.com

Tom Jenkins
Partner,
Governance, Risk and Compliance Services
KPMG China
+852 2143 8570
tom.jenkins@kpmg.com

Yi-Hsin Wang
Director,
Financial Risk Management
KPMG China
+852 2685 7422
yihsin.wang@kpmg.com

kpmg.com/cn/socialmedia