SOUTH AFRICAN RESERVE BANK
Prudential Authority

Financial Sector Regulation Act, 2017 (Act No. 9 of 2017)

Prudential Standard on Credit Valuation Adjustment Framework

The Prudential Authority (PA), under sections 105, 108 and 42(b)(vi) of the Financial Sector Regulation Act, 2017 (Act No. 9 of 2017) read with section 1A of the Banks Act, 1990 (Act No. 94 of 1990) hereby makes Prudential Standard on Credit Valuation Adjustment Framework, as per the Schedule below.

Fundi Tshazibana

Fundi Tshazibana
Chief Executive Officer

Date: 2025-06-30

SCHEDULE

SOUTH AFRICAN RESERVE BANK
Prudential Authority

Banks Act, 1990 (Act No. 94 of 1990)

Financial Sector Regulation Act, 2017 (Act No. 9 of 2017)

Prudential Standard on Credit Valuation Adjustment Framework

Objectives and key requirements of this Prudential Standard

This Standard sets out the principles and requirements for credit valuation adjustment that banks must comply with in line with sound practices and processes in managing risk.

It is the responsibility of the board of a financial institution to ensure that the financial institution meets the requirements set out in this Standard on a continuous basis.

This Standard prescribes requirements with regard to capital for credit valuation adjustment, the basic approach for credit valuation adjustment risk, the standardised approach for credit valuation adjustment risk as well as reporting requirements and applications to the Prudential Authority.

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SCHEDULE

1. Commencement

1.1 This Standard commences on 1 July 2025.

Version number	Commencement date
1	1 July 2025

2. Legislative authority

2.1 This Standard is made under section 1A(3) of the Banks Act, 1990 (Act No. 94 of 1990), read with section 105 of the Financial Sector Regulation Act, 2017 (Act No. 9 of 2017).

3. Application

3.1 This Standard applies to banks, branches[1], branches of banks and controlling companies.

3.2 This Standard sets out the principles and minimum requirements for sound practices and processes related to credit valuation adjustment (CVA).

3.3 This Standard must be read in conjunction with the relevant financial sector laws.

3.4 Banks must ensure that any potential CVA risks from juristic persons, including all relevant subsidiaries approved in terms of section 52 of the Banks Act, 1990 (Act No. 94 of 1990), are catered for and mitigated in the application of the requirements of this Standard.

4. Definitions and interpretation

4.1 In this Standard, **'the Act'** means the Banks Act, 1990 (Act No. 94 of 1990) and any word or expression to which a meaning has been assigned bears the meaning so assigned to it in terms of the Act or the Financial Sector Regulation Act, 2017 (Act No. 9 of 2017) unless the context indicates otherwise -

'banks' collectively means banks, branches, branches of banks and controlling companies as defined and registered in terms of the Act;
'curvature risk' means the additional potential loss beyond delta risk due to a change in a risk factor for financial instruments with optionality. In the standardised approach of the market risk framework, it is based on two stress scenarios involving an upward shock and a downward shock to each regulatory risk factor;
'CVA'

(a) means credit valuation adjustment specified at a counterparty level;
(b) reflects the adjustment of default risk-free prices of derivatives and securities financing transactions (SFTs) due to a potential default of the counterparty; and

[1] Commonly referred to as branches of foreign institutions.

(c) refers to regulatory CVA which may differ from the CVA used for accounting purposes as follows -

(i) regulatory CVA excludes the effect of the bank's own default; and

(ii) several constraints reflecting best practice in accounting CVA are imposed on calculations of regulatory CVA;

'CVA risk' means the risk of losses arising from changing CVA values in response to changes in counterparty credit spreads and market risk factors that drive prices of derivative transactions and securities financing transactions;

'delta risk' means the linear estimate of the change in value of a financial instrument due to a movement in the value of a risk factor. The risk factor could be the price of an equity or commodity, or a change in an interest rate, credit spread or foreign exchange (FX) rate;

'diversification' means the reduction in risk at a portfolio level due to holding risk positions in different instruments that are not perfectly correlated with one another;

'hedge' means the process of counterbalancing risks from exposures to long and short risk positions in correlated instruments;

'offset' means the process of netting exposures to long and short risk positions in the same risk factor;

'SFTs' means securities financing transactions;

'standalone' means being capitalised on a standalone basis which in turn means that risk positions are booked in a discrete, non-diversifiable trading book portfolio so that the risk associated with those risk positions cannot diversify, hedge or offset risk arising from other risk positions, nor be diversified, hedged or offset by them;

'Regulations' means the Regulations relating to Banks as published under Government Notice R1029 in *Government Gazette* 35950 of 12 December 2012, as amended from time to time; and

'vega risk' means the potential loss resulting from the change in value of a derivative due to a change in the implied volatility of its underlying.

5. Roles and responsibilities

5.1 The board is ultimately responsible for ensuring that the bank complies with the principles and requirements as set out in this Standard.

5.2 The board, together with senior management, must ensure that a sound and robust CVA risk management framework is established and maintained.

5.3 The board should clearly define the roles and responsibilities of all management and oversight functions as well as committees established for the purpose of exercising oversight of CVA risk.

6. Capital requirements for CVA risk

6.1 A bank involved in covered transactions in both the banking and trading book must ensure that the capital requirements for CVA risk are calculated and held by the bank.

6.2 Covered transactions include -

(a) all derivatives, except those transacted directly with a qualified central counterparty and those transactions meeting the conditions of regulation 23(16)(b)(ii) to (iv) of the Regulations; and

(b) SFTs that are fair-valued by a bank for accounting purposes, if the Prudential Authority (Authority) determines that the bank's CVA loss exposures arising from SFTs are material. Where a bank deems the exposures immaterial, the bank must justify its assessment to the satisfaction of the Authority by providing relevant supporting documentation.

6.3 The CVA risk capital requirements must be calculated for a bank's 'CVA portfolio' on a standalone basis. The CVA portfolio includes CVA for a bank's entire portfolio of covered transactions and eligible CVA hedges.

6.4 The two approaches for calculating CVA capital requirements are the standardised approach (SA-CVA) and the basic approach (BA-CVA). Banks must utilise the BA-CVA unless prior written approval has been granted by the Authority to use the SA-CVA. Banks that have received prior written approval from the Authority to use the SA-CVA may carve out from the SA-CVA calculations any number of netting sets. CVA capital requirements for all carved-out netting sets must be calculated using the BA-CVA. When applying the carve-out, a legal netting set may also be split into two synthetic netting sets: one containing the carved-out transactions subject to the BA-CVA and the other subject to the SA-CVA, subject to one or both of the following conditions -

(a) The split is consistent with the treatment of the legal netting set used by the bank for calculating accounting CVA (e.g. where certain transactions are not processed by the front office/accounting exposure model).

(b) Supervisory approval to use the SA-CVA is limited and does not cover all transactions within a legal netting set.

6.5 Banks that are below the materiality threshold specified in sub-paragraph (a) below may opt not to calculate their CVA capital requirements using the SA-CVA or BA-CVA and instead choose an alternative treatment.

(a) Any bank − except domestic systemically important banks and branches of global systemically important banks, whose aggregate notional amount of non-centrally cleared derivatives is less than or equal to an amount determined in writing from time to time by the Authority − is deemed as being below the materiality threshold and may choose to set its CVA capital requirement equal to 100% of the bank's capital requirement for counterparty credit risk (CCR).

(b) CVA hedges are not recognised under the treatment.

(c) If chosen, the treatment must be applied to the bank's entire portfolio instead of the BA-CVA or the SA-CVA.

6.6 The Authority, however, may specify in writing that the option mentioned in paragraph 6.5 above does not apply to a particular bank if the Authority determines that CVA risk resulting from the bank's derivative positions materially contributes to the bank's overall risk.

6.7 Eligibility criteria for CVA hedges are specified in paragraph 7.4 (a) to (c) below for the BA-CVA and in paragraph 8.6 for the SA-CVA.

6.8 CVA hedging instruments can be external (with an external counterparty) or internal (with one of the bank's trading desks).

(a) All external CVA hedges (including both eligible and ineligible external CVA hedges) that are covered transactions must be included in the CVA calculation of the counterparty providing the hedge.

(b) All eligible external CVA hedges must be excluded from a bank's market risk capital requirement calculations under the Prudential Standard on Market Risk.

(c) Ineligible external CVA hedges are treated as trading book instruments and are capitalised under the Prudential Standard on Market Risk.

(d) An internal CVA hedge involves two perfectly off-setting positions – one of the CVA desk and the opposite position of the trading desk -

(i) If an internal CVA hedge is ineligible, both positions must be included in the trading book where they cancel each other, so there is no impact on either the CVA portfolio or the trading book.

(ii) If an internal CVA hedge is eligible, the CVA desk's position is part of the CVA portfolio where it is capitalised as set out in this Standard, while the trading desk's position is part of the trading book where it is capitalised as set out in the Prudential Standard on Market Risk.

(e) If an internal CVA hedge involves an instrument that is subject to curvature risk, default risk charge or the residual risk add-on under the standardised approach as set out in paragraph 10 of the Prudential Standard on Market Risk, it can be eligible only if the trading desk that is the CVA desk's internal counterparty executes a transaction with an external counterparty that exactly offsets the trading desk's position with the CVA desk.

6.9 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 requirements when they calculate CCR capital requirements under the internal ratings-based (IRB) approach.[2]

7. Basic approach for CVA risk

7.1 A bank may adopt the BA-CVA calculations by using either the reduced version[3] or the full version[4] depending on the nature, scale and complexity of the bank's respective exposures to risk.

7.2 All banks using the BA-CVA must calculate the reduced version of BA-CVA capital requirements as the reduced BA-CVA is also part of the full BA-CVA capital calculations as a conservative means to limit hedging recognition.

[2] The 'maturity adjustment factor' refers to the 'full maturity adjustment' as defined in footnote 14 of paragraph 53 of the internal ratings-based approach for credit risk (December 2017).

[3]The reduced version eliminates the element of hedging recognition from the full version. The reduced version is designed to simplify BA-CVA implementation for less sophisticated banks that do not hedge CVA.

4 The full version recognises counterparty credit spread hedges and is intended for banks that hedge CVA risk.

7.3 The reduced version of BA-CVA (hedges are not recognised)

(a) The capital requirements for CVA risk under the reduced version of the BA-CVA ($K^{*}_{reduced}$) must be calculated as follows (where summations are taken over all counterparties that are within scope of the CVA charge and where the discount scalar is $DS_{BA\text{-}CVA}$), where -

$$K^{*}_{reduced} = (DS_{BA-CVA} \times \mathrm{K}_{reduced} \text{ ,where } DS_{BA-CVA} = 0.65)$$

(i) $SCVA_c$ is the CVA capital requirement that counterparty c would receive if considered on a standalone basis (referred to as 'standalone CVA capital' below). Refer to sub-paragraph (b) below for the calculation;

(ii) ρ = 50% is the supervisory correlation parameter. Its square, $\rho^2 = 25\%$, represents the correlation between credit spreads of any two counterparties. In the formula below, the effect of ρ is to recognise the fact that the CVA risk to which a bank is exposed is less than the sum of the CVA risk for each counterparty, given that the credit spreads of counterparties are typically not perfectly correlated; and

(iii) the first term under the square root in the formula below aggregates the systematic components of CVA risk, and the second term under the square root aggregates the idiosyncratic components of CVA risk.

$$\mathrm{K}_{reduced} = \sqrt{\left(\rho \cdot \sum_{c} \mathrm{SCVA}_C\right)^2 + (1-\rho^2) \cdot \sum_{c} (\mathrm{SCVA}_C)^2}$$

(b) The standalone CVA capital requirements for counterparty c that are used in the formula ($SCVA_c$) set out in sub-paragraph (a) above must be calculated as follows (where the summation is across all netting sets with the counterparty) where -

(i) RW_c is the risk weight for counterparty c that reflects the volatility of its credit spread. These risk weights are based on a combination of sector and credit quality of the counterparty as prescribed in sub-paragraph (c) below;

(ii) M_{NS} is the effective maturity for the netting set NS. For banks that have supervisory approval to use the IMM, M_{NS} is calculated in accordance with the requirements specified in regulation 23(19)(c)(i) and 23(19)(c)(ii) of the Regulations with the exception that the five-year cap in regulation 23(19)(c)(i) of the Regulations is not applied. For banks that do not have supervisory approval to use the IMM, M_{NS} is calculated according to the relevant requirements specified in regulation 23(13)(d)(i)(B) to regulation 23(13)(d)(v) of the Regulations, with the exception that the five-year cap in regulation 23(13)(d)(ii)(B)(ii) of the Regulations is not applied;

(iii) EAD_{NS} is the exposure at default (EAD) of the netting set NS, calculated in the same way as the bank calculates it for minimum capital requirements for counter-party credit risk;

(iv) DFNS is a supervisory discount factor. It is 1 for banks using the IMM to calculate EAD and is -
$DF_{NS}\ \frac{1-e^{-0.05 \cdot M_{NS}}}{0.05 \cdot M_{NS}}$ for banks not using the IMM; and

(v) α = 1.4.

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

(c) The standard risk weights (RW_C) are specified in

(d) Table 1 below. Credit quality is specified as either investment grade (IG), high yield (HY) or not rated (NR). Where there are no external ratings or where external ratings are not recognised within a jurisdiction, banks may, subject to the prior written approval of the Authority, map the internal rating to an external rating and assign a risk weight corresponding to either IG or HY. Otherwise, the risk weights corresponding to NR must be applied.

Table 1

Supervisory risk weights, RW_C		
Sector of counterparty	Credit quality of counterparty	
	IG	HY and NR

Sovereigns including central banks and multilateral development banks	0.5%	2%
Local government, government-backed non-financials, education and public administration	1%	4%
Financials including government-backed financials	5%	12%
Basic materials, energy, industrials, agriculture, manufacturing, mining and quarrying	3%	7%
Consumer goods and services, transportation and storage, administrative and support service activities	3%	8.5%
Technology, telecommunications	2%	5.5%
Health care, utilities, professional and technical activities	1.5%	5%
Other sector	5%	12%

7.4 Full version of the BA-CVA

(a) The full version of the BA-CVA recognises the effect of counterparty credit spread hedges.

(b) Banks must ensure that only transactions used for the purpose of mitigating the counterparty credit spread component of CVA risk, and managed as such, can be eligible hedges. Only single-name credit default swaps (CDS), single-name contingent CDS and index CDS are eligible CVA hedges.

(c) Eligible single-name credit instruments must -

(i) reference the counterparty directly;

(ii) reference an entity legally related to the counterparty, where legally related refers to cases where the reference name and the counterparty are either a parent and its subsidiary or two subsidiaries of a common parent; or

(iii) reference an entity that belongs to the same sector and region as the counterparty.

(d) Banks using the full version of the BA-CVA must also calculate the reduced version ($\mathrm{K}_{reduced}$).

(e) The capital requirement for CVA risk under the full version is equal to the result of the formula $DS_{BA-CVA} \times \mathrm{K}_{full}$ and is calculated as follows, where $DS_{BA\text{-}CVA}$ = 0.65 and β= 0.25 is the standard parameter that is used to provide a floor that limits the extent to which hedging can reduce the capital requirements for CVA risk -

$$\mathrm{K}_{\mathrm{full}} = \beta \cdot \mathrm{K}_{\mathrm{reduced}} + (1-\beta) \cdot \mathrm{K}_{\mathrm{hedged}}$$

(f) Banks must ensure that the part of capital requirements that recognises eligible hedges (K_{hedged}) is calculated as follows (where the summations are taken over all counterparties *c* that are within scope of the CVA charge), where -

(i) both the standalone CVA capital (SCVA_C) and the correlation parameter (ρ) are defined in exactly the same way as for the reduced version calculation of the BA-CVA;

(ii) SNH_C is a quantity that gives recognition to the reduction in CVA risk of the counterparty *c* arising from the bank's use of single-name hedges of credit spread risk. Refer to sub-paragraph (h) below for its calculation;

(iii) IH is a quantity that gives recognition to the reduction in CVA risk across all counterparties arising from the bank's use of index hedges. Refer to sub-paragraph (i) below for its calculation; and

(iv) HMA_C is a quantity characterising hedging misalignment, which is designed to limit the extent to which indirect hedges can reduce capital requirements given that they will not fully offset movements in a counterparty's credit spread. That is, with indirect hedges present, (K_{hedged}) cannot reach zero. Refer to sub-paragraph (j) below for its calculation.

$$\mathrm{K}_{hedged} = \sqrt{\left(\rho \cdot \sum_c (\mathrm{SCVA}_C - \mathrm{SNH}_C) - IH\right)^2 + (1-\rho^2) \cdot \sum_c (\mathrm{SCVA}_C - \mathrm{SNH}_C)^2 + \sum_c \mathrm{HMA}_C}$$

(g) The formula for $\mathrm{K}_{\mathrm{hedged}}$ as outlined in sub-paragraph (f) above comprises the three following terms -

(i) The first term, $\left(\rho \cdot \sum_c (\mathrm{SCVA}_C - \mathrm{SNH}_C) - IH\right)^2$, aggregates the systemic components of CVA risk arising from the bank's counterparties, the single-name hedges and the index hedges.

(ii) The second term, $(1-\rho^2)\sum_c (\mathrm{SCVA}_C - \mathrm{SNH}_C)^2$, aggregates the idiosyncratic components of CVA risk arising from the bank's counterparties and the single-name hedges.

(iii) The third term, $\sum_c \mathrm{HMA}_C$, aggregates the components of indirect hedges that are not aligned with counterparties' credit spreads.

(h) The quantity SNH_C is calculated as follows (where the summation is across all single-name hedges h that the bank has taken out to hedge the CVA risk of counterparty *c*), where -

(i) r_{hc} is the relevant specified correlation between the credit spread of counterparty *c* and the credit spread of a single-name hedge h of counterparty *c*. The value of r_{hc} is set out in Table 2 below. It is set at 100% if the hedge directly references the counterparty *c* and set at lower values if it does not;

(ii) M_h^{N} is the remaining maturity of single-name hedge h;

(iii) B_h^{N} is the notional of single-name hedge h. For single-name contingent CDS, the notional is determined by the current market value of the reference portfolio or instrument;

(iv) DF_h^{N} is the supervisory discount factor calculated as -

$$DF_h^{\mathrm{N}} = \frac{1-e^{-0.05 \cdot M_h^{SN}}}{0.05 \cdot M_h^{SN}}$$

(v) RW_h is the relevant risk weight of single-name hedge h that reflects the volatility of the credit spread of the reference name of the hedging instrument. These risk weights are based on a combination of the sector and the credit quality of the reference name of the hedging instrument as specific in

(vi) Table 1 above.

$$\mathrm{SNH}_C = \sum_{h \in c} \mathrm{r}_{hc} \cdot RW_h \cdot M_h^{SN} \cdot B_h^{SN} \cdot DF_h^{SN}$$

(i) The quantity IH must be calculated as follows (where the summation is across all index hedges i that the bank has taken out to hedge CVA risk), where -

(i) M_i^{nd} is the remaining maturity of index hedge i;

(ii) B_i^{nd} is the notional of the index hedge i;

(iii) $D\mathrm{F}_i^{\mathrm{nd}}$ is the supervisory discount factor calculated as -

$$DF_i^{ind} = \frac{1 - e^{-0.05 \cdot M_i^{ind}}}{0.05 \cdot M_i^{ind}}$$

(iv) RW_i is the relevant risk weight of the index hedge i. RW_i is taken from Table 1 based on the sector and the credit quality of the index constituents and adjusted as follows -

(aa) For an index where all index constituents belong to the same sector and are of the same credit quality, the relevant value in

Table 1 is multiplied by 0.7 to account for diversification of idiosyncratic risk within the index.

(bb) For an index spanning multiple sectors or with a mixture of investment grade constituents and other grade constituents, the name-weighted average of the risk weights from Table 1 must be calculated and then multiplied by 0.7

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

(j) The quantity HMA_C is calculated as follows (where the summation is across all single-name hedges h that have been taken out to hedge the CVA risk of counterparty *c*), where $\mathrm{r_{hc}}$, M_h^{SN}, B_h^{SN}, DF_h^{SN} and $\mathrm{RW_h}$ have the same definitions as set out in sub-paragraph (h) above.

$$\mathrm{HMA}_C = \sum_{h \in c} \left(1 - r_{hc}^2\right) \cdot \left(RW_h \cdot M_h^{\mathrm{N}} \cdot B_h^{\mathrm{N}} \cdot D\mathrm{F}_h^{\mathrm{N}}\right)^2$$

(k) The relevant specified correlations r_{hc} between the credit spread of counterparty *c* and the credit spread of its single-name hedge h are set in Table 2 below.

Table 2

Correlations between credit spread of counterparty and single-name hedge	
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%

8. Standardised approach for CVA risk

8.1 The SA-CVA is an adaptation of the standardised approach for market risk set out in paragraph 10 of the Prudential Standard on Market Risk. The primary differences of the SA-CVA from the standardised approach for market risk are -

(a) the SA-CVA features a reduced granularity of market risk factors; and

(b) the SA-CVA does not include default risk and curvature risk.

8.2 Under the SA-CVA, capital requirements must be calculated and reported to the Authority at the same monthly frequency as for the market risk standardised approach. In addition, banks using the SA-CVA must be able to calculate the relevant SA-CVA capital requirement at the request of the Authority and must accordingly be able to provide the relevant calculations to the Authority.

8.3 The SA-CVA uses as inputs the sensitivities of CVA to counterparty credit spreads and market risk factors driving the values of covered transactions. Sensitivities must be computed by banks in accordance with the prudent valuation standards (requirements set by the Prudential Authority) set out in regulation 39(13) of the Regulations.

8.4 For a bank to be considered eligible for the use of SA-CVA by the Authority as set out in paragraph 6.4 above, the bank must, at a minimum, meet the following criteria -

(a) 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 specified in paragraphs 8.9 to 8.14 below.

(b) A bank must have a CVA desk (or a similar dedicated function) responsible for risk management and hedging of CVA.

8.5 Regulatory CVA calculations

(a) A bank must calculate CVA for each counterparty with which it has at least one covered position for the purpose of the CVA risk capital requirements.

(b) CVA at a counterparty level must be calculated according to the principles listed in sub-items (i) to (ix) below. A bank must demonstrate its compliance with the principles to the satisfaction of the Authority -

(i) CVA must be calculated as the expectation of future losses resulting from default of the counterparty under the assumption that the bank itself is free from the default risk. In expressing the regulatory CVA, non-zero losses must have a positive sign. This is reflected in paragraph 8.9(k) where WS_k^{Hdg} must be subtracted from WS_k^{CVA}.

(ii) The calculation must be based on at least the following three sets of inputs -

(aa) term structure of market-implied probability of default (PD);

(bb) market-consensus expected loss given default (ELGD); and

(cc) simulated paths of discounted future exposure.

(iii) The term structure of market-implied PD must be estimated from credit spreads observed in the markets. For counterparties whose credit is not actively traded (i.e. illiquid counterparties), the market-implied PD must be estimated from proxy credit spreads estimated for these counterparties according to the following requirements -

(aa) A bank must estimate the credit spread curves of illiquid counterparties from credit spreads observed in the markets of the counterparty's liquid peers via an algorithm that discriminates on at least the following three variables – a measure of credit quality (e.g. rating), industry and region.

(bb) In certain cases, mapping an illiquid counterparty to a single liquid reference name can be allowed.[5] A bank must be able to justify to the satisfaction of the Authority each case of mapping an illiquid counterparty to a single liquid reference name.

(cc) When no credit spreads of any of the counterparty's peers are available due to the counterparty's specific type (e.g. project finance, funds), a bank may, with the prior written approval of and subject to such conditions as may be specified in writing by the Authority, be allowed to use a more fundamental analysis of credit risk to proxy the spread of an illiquid counterparty. However, where historical PDs are used as part of this assessment, the resulting spread cannot be based on historical PD only – it must relate to credit markets.

(iv) The market-consensus ELGD value must be the same as the one used to calculate the risk-neutral PD from credit spreads unless the bank can demonstrate to the satisfaction of the Authority that the seniority of the exposure resulting from covered positions differs from the seniority of senior unsecured bonds. Collateral provided by the counterparty does not change the seniority of the exposure.

[5] A typical example would be mapping a municipality to its home country (i.e. setting the municipality credit spread equal to the sovereign credit spread plus a premium).

(v) The simulated paths of discounted future exposure are produced by pricing all derivative transactions with the counterparty along the simulated paths of relevant market risk factors and discounting the prices to the relevant present value using risk-free interest rates along the path.

(vi) All market risk factors material for the transactions with a counterparty must be simulated as stochastic processes for an appropriate number of paths defined on an appropriate set of future time points extending to the maturity of the longest transaction.

(vii) For transactions with a significant level of dependence between exposure and the counterparty's credit quality, this dependence must be considered.

(viii) For margined counterparties, collateral is permitted to be recognised as a risk mitigant under the following conditions -

(aa) Collateral management requirements specified in regulation 39(8)(c)(i) to regulation 39(8)(c)(v) of the Regulations are met.

(bb) All documentation used in collateralised transactions must be binding on all parties and legally enforceable in all relevant jurisdictions. Banks must have conducted sufficient legal review to verify this and have a well-founded legal basis to reach this conclusion, and undertake such further review as necessary to ensure continuing enforceability.

(ix) For margined counterparties, the simulated paths of discounted future exposure must capture the effects of margining collateral that is recognised as a risk mitigant along each exposure path. All the relevant contractual features, such as the nature of the margin agreement (unilateral versus bilateral), the frequency of margin calls, the type of collateral, thresholds, independent amounts, initial margins and minimum transfer amounts, must be appropriately captured by the exposure model. To determine the collateral available to a bank at a given exposure measurement time point, the exposure model must assume that the counterparty will not post or return any collateral within a certain time period immediately prior to that time point. The assumed value of this time period, known as the margin period of risk (MPoR), cannot be less than the relevant specified floor. For SFTs and client-cleared transactions as specified in regulation 23(16)(b)(ii)(A) of the Regulations, the relevant floor for the MPoR is equal to 4+N business days, where N is the re-margining period specified in the margin agreement (in particular, for margin agreements with daily or intra-daily exchange of margin, the minimum MPoR is five business days). For all other transactions, the relevant floor for the MPoR is equal to 9+N business days.

(c) The simulated paths of discounted future exposure are obtained via the exposure models used by a bank for calculating front office/accounting CVA, adjusted (if needed) to meet the requirements imposed for regulatory CVA calculation. The model calibration process (with the exception of the MPoR), and market and transaction data used for CVA calculation must be the same as those used for accounting CVA calculation.

(d) The generation of market risk factor paths underlying the exposure models must satisfy, and a bank must continually demonstrate to the satisfaction of the Authority, its compliance with the following requirements -

(i) Drifts of risk factors must be consistent with a risk-neutral probability measure. Historical calibration of drifts is not allowed.

(ii) The volatilities and correlations of market risk factors must be calibrated to market data whenever sufficient data exist in a given market. Otherwise, historical calibration is permissible.

(iii) The distribution of modelled risk factors must account for the possible non-normality of the distribution of exposures, including the existence of leptokurtosis ('fat tails'), where appropriate.

(e) Netting recognition is the same as in the accounting CVA calculations used by the bank. In particular, netting uncertainty can be modelled.

(f) A bank must satisfy and demonstrate to the satisfaction of the Authority its compliance with the following requirements -

(i) Exposure models used for calculating CVA must be part of a CVA risk management framework that includes the identification, measurement, management, approval and internal reporting of CVA risk. A bank must have a credible track record in using these exposure models for calculating CVA and CVA sensitivities to market risk factors.

(ii) Senior management must be actively involved in the risk control process and must regard CVA risk control as an essential aspect of the business to which significant resources need to be devoted.

(iii) A bank must have a process in place for ensuring compliance with a documented set of internal policies, controls and procedures concerning the operation of the exposure system used for accounting CVA calculations.

(iv) A bank must have an independent control unit that is responsible for the effective initial and ongoing validation of the exposure models. This unit must be independent from business credit and trading units (including the CVA desk), must be adequately staffed and must report directly to senior management of the bank.

(v) A bank must document the process for initial and ongoing validation of its exposure models to a level of detail that would enable a third party to understand how the models operate, their limitations and their key assumptions, and recreate the analysis. This documentation must set out the minimum frequency with which ongoing validation will be conducted as well as other circumstances (such as a sudden change in market behaviour) under which additional validation should be conducted. In addition, the documentation must describe how the validation is conducted with respect to data flows and portfolios, what analyses are used and how representative counterparty portfolios are constructed.

(vi) The pricing models used to calculate exposure for a given path of market risk factors must be tested against appropriate independent benchmarks for a wide range of market states as part of the initial and ongoing model validation process. Pricing models for options must account for the non-linearity of option value with respect to market risk factors.

(vii) An independent review of the overall CVA risk management process must be carried out regularly in the bank's own internal auditing process. This review must include both the activities of the CVA desk and of the independent risk control unit.

(viii) A bank must define criteria on which to assess the exposure models and their inputs and have a written policy in place to describe the process to assess the performance of exposure models and remedy unacceptable performance.

(ix) Exposure models must capture transaction-specific information in order to aggregate exposures at the level of the netting set. A bank must verify that transactions are assigned to the appropriate netting set within the model.

(x) Exposure models must reflect transaction terms and specifications in a timely, complete and conservative manner. The terms and specifications must reside in a secure database that is subject to formal and periodic audit. The transmission of transaction terms and specifications data to the exposure model must also be subject to internal audit, and formal reconciliation processes must be in place between the internal model and source data systems to verify on an ongoing basis that transaction terms and specifications are being reflected in the exposure system correctly or at least conservatively.

(xi) The current and historical market data must be acquired independently of the lines of business and be compliant with accounting. They must be fed into the exposure models in a timely and complete fashion and maintained in a secure database subject to formal and periodic audit. A bank must also have a well-developed data integrity process to handle the data of erroneous and/or anomalous observations. In the case where an exposure model relies on proxy market data, a bank must set internal policies to identify suitable proxies and the bank must demonstrate empirically on an ongoing basis that the proxy provides a conservative representation of the underlying risk under adverse market conditions.

8.6 Eligible hedges

(a) Only whole transactions that are used for the purpose of mitigating CVA risk, and managed as such, shall be regarded as eligible hedges. Transactions cannot be split into several effective transactions.

(b) Eligible hedges can include -

(i) instruments that hedge variability of the counterparty credit spread; and

(ii) instruments that hedge variability of the exposure component of CVA risk.

(c) Instruments that are not eligible for the internal models approach for market risk under paragraph 11 of the Prudential Standard on Market Risk (e.g. tranched credit derivatives) are also not eligible hedges for the purposes of CVA.

8.7 Multiplier

(a) Aggregated capital requirements can be scaled up by the multiplier m_{CVA}.

(b) The multiplier m_{CVA} is set at 1. The Authority may require a bank to use a higher value of m_{CVA} if the Authority determines that the bank's CVA model risk warrants it (e.g. if the level of model risk for the calculation of CVA sensitivities is too high or the dependence between the bank's exposure to a counterparty and the counterparty's credit quality is not appropriately taken into account in its CVA calculations).

8.8 Calculations

(a) The SA-CVA capital requirements are calculated as the sum of the capital requirements for delta and vega risks calculated for the entire CVA portfolio (including eligible hedges).

(b) The capital requirements for delta risk are calculated as the simple sum of delta capital requirements calculated independently for the following six risk classes -

(i) interest rate risk;
(ii) FX risk;
(iii) counterparty credit spread risk;
(iv) reference credit spread risk (credit spreads that drive the CVA exposure component);
(v) equity risk; and
(vi) commodity risk.

(c) If an instrument is deemed as an eligible hedge for credit spread delta risk, it must be assigned in its entirety (see paragraph 8.6(a) above) either to the counterparty credit spread or to the reference credit spread risk class. Instruments must not be split between the two risk classes.

(d) The capital requirements for vega risk are calculated as the simple sum of vega capital requirements calculated independently, of which there are five. There are no vega capital requirements for counterparty credit spread risk. The five risk classes are -

(i) interest rate risk;
(ii) FX risk;
(iii) reference credit spread risk;
(iv) equity risk; and
(v) commodity risk.

(e) Delta and vega capital requirements are calculated in the same manner using the same procedures set out in sub-paragraphs (f) to (l) below.

(f) For each risk class -

(i) the sensitivity of the aggregate CVA, S_k^{CVA}; and
(ii) the sensitivity of the market value of all eligible hedging instruments in the CVA portfolio, S_k^{Hdg}, to each risk factor k in the risk class are calculated. The sensitivities are defined as the ratio of the change of the value in question (i.e. (i) aggregate CVA or (ii) market value of all CVA hedges) caused by a small change of the risk factor's current value to the size of the change. Specific

definitions for each risk class are set out in paragraphs 8.9 to 8.14 below. These definitions include specific values of changes or shifts in risk factors. However, subject to the prior written approval of and such conditions as may be specified in writing by the Authority, a bank may use smaller values of risk factor shifts if doing so is consistent with internal risk management calculations. A bank may use adjoint algorithmic differentiation and similar computational techniques to calculate CVA sensitivities under the SA-CVA if doing so is consistent with the bank's internal risk management calculations and the relevant validation standards described in the SA-CVA framework.

(g) CVA sensitivities for vega risk are always material and must be calculated regardless of whether or not the portfolio includes options. When CVA sensitivities for vega risk are calculated, the volatility shift must apply to both types of volatilities that appear in exposure models -
  (i) volatilities used for generating risk factor paths; and
  (ii) volatilities used for pricing options.

(h) If a hedging instrument is an index, its sensitivities to all risk factors upon which the value of the index depends must be calculated. The index sensitivity to risk factor k must be calculated by applying the shift of risk factor k to all index constituents that depend on this risk factor and recalculating the changed value of the index. [6]

(i) For the three risk classes below, a bank may choose to introduce a set of additional risk factors that directly corresponds to qualified credit and equity indices. For delta risks, a credit or equity index is qualified if it satisfies liquidity and diversification conditions specified in the sensitivities-based method outlined in paragraphs 10.7.57 and 10.7.58 of the Prudential Standard on Market Risk. For vega risks, any credit or equity index is qualified. Under this option, a bank must calculate sensitivities of CVA and the eligible CVA hedges to the qualified index risk factors in addition to sensitivities to the non-index risk factors. Under this option, for a covered transaction or an eligible hedging instrument whose underlying is a qualified index, its contribution to sensitivities to the index constituents is replaced with its contribution to a single sensitivity to the underlying index. For example, for a portfolio consisting only of equity derivatives referencing only qualified equity indices, no calculation of CVA sensitivities to non-index equity risk factors is necessary. If more than 75% of the constituents of a qualified index (taking into account the weightings of the constituents) are mapped to the same sector, the entire index must be mapped to that sector and treated as a single-name sensitivity in that bucket. In all other cases, the sensitivity must be mapped to the applicable index bucket. The risk classes are -
  (i) counterparty credit spread risk;
  (ii) reference credit spread risk; and
  (iii) equity risk.

[6] For example, to calculate the delta sensitivity of the S&P500 to large financial companies, a bank must apply the relevant shift to equity prices of all large financial companies that are constituents of S&P500 and re-compute the index.

(j) The weighted sensitivities WS_k^{CVA} and WS_k^{Hdg} for each risk factor k are calculated by multiplying the net sensitivities S_k^{CVA} and S_k^{Hdg} respectively by the corresponding risk weight RW_k (the risk weights applicable to each risk class are specified in paragraphs 8.9 to 8.14 below).

$$WS_k^{CVA} = RW_k S_k^{CVA}$$
$$WS_k^{Hdg} = RW_k S_k^{Hdg}$$

(k) The net weighted sensitivity of the CVA portfolio S_k to risk factor k is obtained by[7] -

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

(l) For each risk class, the net sensitivities are aggregated as follows -

(i) The weighted sensitivities must be aggregated into a capital requirement K_b within each bucket b (the buckets and correlation parameters ρ_{kl} applicable to each risk class are specified in paragraph 8.9 to 8.14 below, where *R* is the hedging disallowance parameter, set at 0.01, that prevents the possibility of recognising perfect hedging of CVA risk.

$$\mathrm{K}_b = \sqrt{\left(\sum_{k\in b} WS_k^2 + \sum_{k\in b}\sum_{l\in b, l\neq k} p_{kl} WS_k WS_l\right) + R \cdot \sum_{k\in b}\left(\left(WS_k^{Hdg}\right)^2\right)}$$

(ii) Bucket-level capital requirements must then be aggregated across buckets within each risk class (the correlation parameters γ_{bc} applicable to each risk class are specified in paragraph 8.9 to 8.14 below). This equation differs from the corresponding aggregation equation for market risk capital requirements in paragraph 10.6.13 of the Prudential Standard on Market Risk, including the multiplier m_{cva}.

$$K = m_{cva}\sqrt{\sum_b K_b^2 + \sum_b \sum_{b\neq c} \gamma_{bc} S_b S_c}$$

(iii) In calculating K in (ii) above, S_b is defined as the sum of the weighted sensitivities WS_k for all risk factors k within bucket b,

[7] Note that the formula is set out under the convention that the CVA is positive as specified in paragraph 8.5(b)(i). It intends to recognise the risk-reducing effect of hedging.

floored by -K_b and capped by K_b , and the S_c is defined in the same way for all risk factors k in bucket c -

$$S_b = max\left\{-K_b; min\left(\sum_{k\in b} WS_k ; K_b\right)\right\}$$

$$S_c = max\left\{-K_c; min\left(\sum_{k\in c} WS_k ; K_c\right)\right\}$$

8.9 Interest rate buckets, risk factors, sensitivities, risk weights and correlations

(a) For interest rate delta and vega risks, buckets must be set per individual currencies.

(b) For interest rate delta and vega risks, cross-bucket correlation γbc is set at 0.5 for all currency pairs.

(c) The interest rate delta risk factors for a bank's reporting currency and for the following currencies USD, EUR, GBP, AUD, CAD, SEK or JPY -

(i) The interest rate delta risk factors are the absolute changes of the inflation rate and of the risk-free yields for five tenors, namely 1 year, 2 years, 5 years, 10 years and 30 years.

(ii) The sensitivities to the above-mentioned risk-free yields are measured by changing the risk-free yield for a given tenor for all curves 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. The sensitivity to the inflation rate is obtained by changing the inflation rate 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.

(iii) The risk weights RW_k are set out in

(iv) Table 3 below.

(v) The correlations between pairs of risk factors ρ_{kl} are set out in

(vi)

(vii) Table 4 below.

Table 3

Risk weight for interest rate risk (specified currencies)						
Risk factor	1 year	2 years	5 years	10 years	30 years	Inflation
Risk weight	1.11%	0.93%	0.74%	0.74%	0.74%	1.11%

Table 4

Correlations for interest rate risk factors (specified currencies)						
	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%

(d) The interest rate delta risk factors for other currencies not specified in sub-paragraph (c) above -

(i) The interest rate risk factors are the absolute change of the inflation rate and the parallel shift of the entire risk-free yield curve for a given currency.

(ii) The sensitivity to the yield curve is measured by applying a parallel shift to all risk-free yield curves 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. The sensitivity to the inflation rate is obtained by changing the inflation rate 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.

(iii) The risk weights for both the risk-free yield curve and the inflation rate RW_k are set at 1.58%.

(iv) The correlations between the risk-free yield curve and the inflation rate ρ_{kl} are set at 40%.

(e) The interest rate vega risk factors for all currencies -

(i) The interest rate vega risk factors are a simultaneous relative change of all volatilities for the inflation rate and a simultaneous relative change of all interest rate volatilities for a given currency.

(ii) The sensitivity to (aa) the interest rate volatilities or (bb) inflation rate volatilities is measured by respectively applying a simultaneous shift to (aa) all interest rate volatilities or (bb) inflation rate volatilities 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.

(iii) The risk weights for both the interest rate volatilities and the inflation rate volatilities RW_k are set to 100%.

(iv) Correlations between the interest rate volatilities and the inflation rate volatilities ρ_{kl} are set at 40%.

8.10 Foreign exchange buckets, risk factors, sensitivities, risk weights and correlations

(a) For FX delta and vega risks, buckets must be set per individual currencies except for a bank's own reporting currency.

(b) For FX delta and vega risks, the cross-bucket correlation γ_{bc} is set at 0.6 for all currency pairs.

(c) The FX delta risk factors for all currencies -

(i) The single FX delta risk factor is defined as the relative change of the FX spot rate between a given currency and a bank's reporting currency, where the FX spot rate is the current market price of one unit of another currency expressed in the units of the bank's reporting currency.

(ii) Sensitivities to FX spot rates are measured by shifting the exchange rate between the bank's reporting currency and another currency (the value of one unit of another currency expressed in units of the reporting currency) 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. For transactions that reference an exchange rate between a pair of non-reporting currencies, the sensitivities to the FX spot rates between the bank's reporting currency and each of the referenced non-reporting currencies must be measured.[8]

(iii) The risk weights for all exchange rates between the bank's reporting currency and another currency are set at 11%.

(d) The FX vega risk factors for all currencies -

(i) The single FX vega risk factor is a simultaneous relative change of all volatilities for an exchange rate between a bank's reporting currency and another given currency.

(ii) The sensitivities to the FX volatilities are measured by simultaneously shifting all volatilities for a given exchange rate between the bank's reporting currency and another currency 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. For transactions that reference an exchange rate between a pair of non-reporting currencies, the volatilities of the FX spot rates between the bank's reporting currency and each of the referenced non-reporting currencies must be measured.

(iii) The risk weights for FX volatilities RW_k are set to 100%.

8.11 Counterparty credit spread buckets, risk factors, sensitivities, risk weights and correlations

(a) Counterparty credit spread risk is not subject to vega risk capital requirements. Buckets for delta risk are set as follows -

(i) Buckets 1 to 7 are defined for factors that are not qualified indices as set out in paragraph 8.8(i).

(ii) Bucket 8 is set for the optional treatment of qualified indices. Under the optional treatment, only instruments that reference qualified indices can be assigned to bucket 8, while all single-name and all non-qualified index hedges must be assigned to buckets 1 to 7 for calculations of CVA sensitivities and sensitivities. For any instrument referencing an index assigned to buckets 1 to 7, the look-through approach must be used (sensitivity of the hedge to each index constituent must be calculated).

[8] For example, if a ZAR-reporting bank holds an instrument that references the USD-GBP exchange rate, the bank must measure CVA sensitivity both to the GBP-ZAR exchange rate and to the USD-ZAR exchange rate.

(iii) **Error! Reference source not found.** below sets out the buckets for counterparty credit spread delta risk.

Table 5

Buckets for counterparty credit spread delta risk	
Bucket number	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
8	Qualified Indices

(b)

Table 6 below sets out the cross-bucket correlation γ_{bc} for counterparty credit spread delta risk.

Table 6

Cross-bucket correlations for counterparty credit spread delta risk								
Bucket	1	2	3	4	5	6	7	8
1	100%	10%	20%	25%	20%	15%	0%	45%
2		100%	5%	15%	20%	5%	0%	45%
3			100%	20%	25%	5%	0%	45%
4				100%	25%	5%	0%	45%
5					100%	5%	0%	45%
6						100%	0%	45%
7							100%	0%
8								100%

(c) The counterparty credit spread delta risk factors for a given bucket -

(i) The counterparty credit spread delta risk factors are absolute shifts of credit spreads of individual entities (counterparties and reference names for counterparty credit spread hedges) and qualified indices (if the optional treatment is chosen) for the following tenors - 0.5 years, 1 year, 3 years, 5 years and 10 years.

(ii) For each entity and each tenor point, the sensitivities are measured by shifting the relevant credit spread 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.

(iii) The risk weights RW_k as set in Table 7 below depend on the entity's bucket, where IG, HY and NR represent 'investment

grade', 'high yield' and 'not rated' as specified for the BA-CVA in paragraph 7.3(c) above. The same risk weight for a given bucket and given credit quality applies to all tenors.

Table 7

Risk weights for counterparty credit spread delta risk									
Bucket	1 a)	1 b)	2	3	4	5	6	7	8
IG names	0.5%	1.0%	5.0%	3.0%	3.0%	2.0%	1.5%	5.0%	1.5%
HY and NR names	2.0%	4.0%	12.0%	7.0%	8.5%	5.5%	5.0%	12.0%	5.0%

(iv) For buckets 1 to 7, the correlation parameter ρ_{kl} between two weighted sensitivities WS_k and WS_l is calculated as follows, where -

(aa) ρ_{tenor} is equal to 100% if the two tenors are the same and 90% otherwise;

(bb) ρ_{name} is equal to 100% if the two names are the same, 90% if the two names are distinct, but legally related and 50% otherwise;

(cc) ρ_{quality} is equal to 100% if the credit quality of the two names is the same (IG and IG or HY/NR and HY/NR) and 80% otherwise.

$$\rho_{kl} = \rho_{tenor} \cdot \rho_{name} \cdot \rho_{quality}$$

(v) For bucket 8, the correlation parameter ρ_{kl} between two weighted sensitivities WS and WS is calculated as follows, where -

(aa) ρ_{tenor} is equal to 100% if the two tenors are the same and 90% otherwise;

(bb) ρ_{name} is equal to 100% if the two indices are the same and of the same series, 90% if the two indices are the same, but of distinct series, and 80% otherwise;

(cc) ρ_{quality} is equal to 100% if the credit quality of the two indices is the same (example, IG and IG or HY and HY) and 80% otherwise.

$$\rho_{kl} = \rho_{tenor} \cdot \rho_{name} \cdot \rho_{quality}$$

8.12 Reference credit spread buckets, risk factors, sensitivities, risk weights and correlations

(a) Reference credit spread risk is subject to both delta and vega risk capital requirements. Buckets for delta and vega risks are set in Table 8, below where IG, HY and NR represent 'investment grade', 'high yield' and 'not rated' as specified for the BA-CVA in paragraph 7.3(c) above.

Table 8

Buckets for reference credit spread risk		
Bucket number	Credit quality	Sector
1	IG	Sovereigns including central banks, multilateral development banks
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 and NR	Sovereigns including central banks, multilateral development banks
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
16	IG	Qualified Indices
17	HY	Qualified Indices

(b) For reference credit spread delta and vega risks, the cross-bucket correlations γ_{bc} are set out as follows -

(i) The cross-bucket correlations γ_{bc} between buckets of the same credit quality (either IG or HY/NR) are set out in Table 9 below.

Table 9

Cross-bucket correlations for reference credit spread risk										
Bucket	1/8	2/9	3/10	4/11	5/12	6/13	7/14	15	16	17
1/8	100%	75%	10%	20%	25%	20%	15%	0%	45%	45%
2/9		100%	5%	15%	20%	15%	10%	0%	45%	45%
3/10			100%	5%	15%	20%	5%	0%	45%	45%
4/11				100%	20%	25%	5%	0%	45%	45%
5/12					100%	25%	5%	0%	45%	45%
6/13						100%	5%	0%	45%	45%
7/14							100%	0%	45%	45%
15								100%	0%	0%
16									100%	75%
17										100%

(ii) For cross-bucket correlations γ_{bc} between buckets 1 to 14 of different credit quality (IG and HY/NR), the correlations γ_{bc} specified in subparagraph (i) above are divided by 2.

(c) Reference credit spread delta risk factors for a given bucket -

(i) The single reference credit spread delta risk factor is a simultaneous absolute shift of the credit spreads of all tenors for all reference names in the bucket.

(ii) The sensitivity to reference credit spread delta risk is measured by simultaneously shifting the credit spreads of all tenors for all reference names in the bucket 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.

(iii) The risk weights RW_k are set out in Table 10 below depending on the reference name's bucket.

Table 10

Risk weights for reference credit spread delta risk									
IG bucket	1	2	3	4	5	6	7	8	9
Risk weight	0.5%	1.0%	5.0%	3.0%	3.0%	2.0%	1.5%	2.0%	4.0%
HY/NR bucket	10	11	12	13	14	15	16	17	
Risk weight	12.0%	7.0%	8.5%	5.5%	5.0%	12.0%	1.5%	5.0%	

(d) Reference credit spread vega risk factors for a given bucket -

(i) 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.

(ii) The sensitivity to the reference credit spread vega risk factor is measured by simultaneously shifting the volatilities of credit spreads of all tenors for all reference names in the bucket 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.

(iii) Risk weights for reference credit spread volatilities RW_k are set to 100%.

8.13 Equity buckets, risk factors, sensitivities, risk weights and correlations

(a) For equity delta and vega risks, buckets are set as follows, where -

(i) '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. The reference to 'group of legal entities' covers cases where the listed entity is a parent company of a group of legal entities. Under no circumstances should the sum of the market capitalisations of multiple related listed entities be used to determine whether a listed entity is 'large market cap' or 'small market cap'.

(ii) 'Large market cap' is defined as a market capitalisation equal to or greater than an amount to be determined by the Authority and 'small market cap' is defined as a market capitalisation of less than the amount to be determined by the Authority.

(iii) The advanced economies are Canada, the United States, Mexico, the euro area, the non-euro area western European countries (the United Kingdom, Norway, Sweden, Denmark and Switzerland), Japan, Oceania (Australia and New Zealand), Singapore and Hong Kong SAR.

(iv) 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. The bank must assign each issuer to one of the sector buckets in the table below and it must assign all issuers from the same industry to the same sector. Risk positions from any issuer that a bank cannot assign to a sector must be assigned to the 'other sector' (bucket 11). 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.

(v) Table 11 below sets out the buckets for equity risk.

Table 11

Buckets for equity risk			
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
12	Large cap, advanced economies		Qualified Indices
13	Other		Qualified Indices

(b) For equity delta and vega risks, cross-bucket correlation γ_{bc} is set at 15% for all cross-bucket pairs that fall within bucket numbers 1 to 10. The cross-bucket correlation between buckets 12 and 13 is set at 75% and the cross-bucket correlation between buckets 12 or 13 and any of the buckets 1–10 is 45%. γ_{bc} is set at 0% for all cross-bucket pairs that include bucket 11.

(c) Equity delta risk factors for a given bucket -

(i) The single equity delta risk factor is a simultaneous relative shift of equity spot prices for all reference names in the bucket.

(ii) The sensitivity to the equity delta risk factor is measured by simultaneously 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 (or the value of CVA hedges) by 0.01.

(iii) Risk weights RW_k are set in Table 12 below depending on the reference name's bucket.

Table 12

Risk weights for equity delta risk	
Bucket number	Risk weight
1	55%
2	60%
3	45%
4	55%
5	30%
6	35%
7	40%
8	50%
9	70%
10	50%
11	70%
12	15%
13	25%

(d) Equity vega risk factors for a given bucket -

(i) The single equity vega risk factor is a simultaneous relative shift of the volatilities for all reference names in the bucket.

(ii) The sensitivity to the equity vega risk factor is measured by simultaneously 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 (or the value of CVA hedges) by 0.01.

(iii) The risk weights for equity volatilities RW_k are set to 78% for large market capitalisation buckets and to 100% for the other buckets.

8.14 Commodity buckets, risk factors, sensitivities, risk weights and correlations

(a) For commodity delta and vega risks, buckets are set out in Table 13 below.

Table 13

Buckets for commodity risk		
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, heavy, West Texas Intermediate and Brent); biofuels (such as bioethanol and biodiesel); petrochemicals (such as propane, ethane, gasoline, methanol and butane); refined fuels (such as jet fuel, kerosene, gasoil, fuel oil, naphtha, heating 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 EU allowance, Regional Greenhouse Gas Initiative CO2 allowance and renewable energy certificates)
4	Freight	dry-bulk route (such as Capesize, Panamax, 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, copper, lead, nickel, tin and zinc); steel raw materials (such as steel billet, steel wire, steel coil, steel scrap and steel rebar, iron ore, tungsten, vanadium, titanium 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 and 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 and dairy	cattle (such live and feeder); hog; poultry; lamb; fish; shrimp; dairy (such as milk, whey, eggs, butter 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

(b) For commodity delta and vega risks, cross-bucket correlation γ_{bc} is set at 20% for all cross-bucket pairs that fall within bucket numbers 1 to 10. γ_{bc} is set at 0% for all cross-bucket pairs that include bucket 11.

(c) Commodity delta risk factors for a given bucket -

(i) The single commodity delta risk factor is a simultaneous relative shift of the commodity spot prices for all commodities in the bucket.
(ii) The sensitivities to commodity delta risk factors are measured by simultaneously 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 (or the value of CVA hedges) by 0.01.
(iii) The risk weights RW_k are set out in Table 14 below depending on the reference name's bucket.

Table 14

Risk weights for commodity delta risk											
Bucket number	1	2	3	4	5	6	7	8	9	10	11
RW	30%	35%	60%	80%	40%	45%	20%	35%	25%	35%	50%

(d) Commodity vega risk factors for a given bucket -
(i) The single commodity vega risk factor is a simultaneous relative shift of the volatilities for all commodities in the bucket.
(ii) The sensitivity to the commodity vega risk factor is measured by simultaneously 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 (or the value of CVA hedges) by 0.01.
(iii) The risk weights for commodity volatilities RW_k are set to 100%.

9. Regulatory action

For the purposes of this Prudential Standard, the Authority may apply the provisions of regulation 38(4) of the Regulations in the circumstances outlined in the regulation.

10. Applications to the Prudential Authority

The Authority may determine the form and manner of the applications required in this Standard.

11. Reporting requirements

11.1 The Authority may determine the form, manner and period for regulatory reporting for this Prudential Standard, where such requirements have not been specified in this Standard.
11.2 The determination referred to paragraph 11.1 above will be published on the website of the Authority.