BANK NEGARA MALAYSIA
CENTRAL BANK OF MALAYSIA

Capital Adequacy Framework (Counterparty Credit Risk)

Exposure Draft

Applicable to:

1. Licensed banks
2. Licensed investment banks
3. Licensed Islamic banks
4. Financial holding companies

Issued on: 28 November 2025

BNM/RH/ED 029-39

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This Exposure Draft ("ED") sets out the proposals for calculating counterparty credit risk capital requirements under the Basel III framework. A key component of this ED is the Standardised Approach to Counterparty Credit Risk ("SA-CCR"), which accords better recognition of legally enforceable netting and margining agreements as compared to the Current Exposure Method ("CEM"). Upon implementation, SA-CCR will replace the CEM.

The Bank is also revising certain requirements in the policy document on *Leverage Ratio* to account for the SA-CCR requirements. The proposed revisions are enclosed in Appendix 7 of this ED.

In respect of the submission of feedback–

(a) the Bank invites written feedback on the proposed regulatory requirements in this ED, including suggestions for specific issues or areas to be clarified or elaborated further and alternative proposals that the Bank should consider. The written feedback should refer to the applicable paragraph where appropriate, be constructive and be supported with clear rationales and appropriate evidence, examples or illustrations, to facilitate the Bank's assessment;

(b) financial institutions are expected to respond to the specific questions set out in the ED, in addition to providing general feedback; and

(c) the Bank also welcomes financial institutions to provide feedback on the specific guidance provided for the purposes of completing the Quantitative Impact Study ("QIS") on SA-CCR, which was issued to the industry on 30 May 2025.

Submissions should be made electronically to the Bank through this Microsoft Form link (https://forms.office.com/r/J47XtfdawQ) by 31 March 2026. Submissions received may be made public unless confidentiality is specifically requested for the whole or part of the submission.

In the course of preparing your feedback, you may direct any queries to the following officers:

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PART A OVERVIEW

1. Introduction

1.1 The policy document on *Capital Adequacy Framework (Counterparty Credit Risk)* ("Policy Document") sets out the standards and guidance on the computation of the counterparty credit risk capital requirements in line with the Basel III standards set by the Basel Committee on Banking Supervision ("BCBS")[1].

1.2 A key component of this Policy Document is the Standardised Approach for Counterparty Credit Risk ("SA-CCR"). SA-CCR is a risk-sensitive measurement for counterparty credit risk exposure value that promotes risk mitigation through legally enforceable netting and margining agreements.

1.3 The provisions on (i) the applicability of this Policy Document, (ii) the legal provisions pursuant to which this Policy Document is issued, (iii) the terms and expressions used in this Policy Document, (iv) the related legal instruments and policy documents, and (v) the level of application of this Policy Document shall be as follows:

Policy Document	**Paragraph**
Capital Adequacy Framework (Capital Components) issued on 14 June 2024 ("CAF CC PD") and as may be amended by the Bank	• Paragraph 2 on 'Applicability' • Paragraph 3 on 'Legal Provisions' • Paragraph 5 on 'Interpretation' subject to paragraph 3 of this Policy Document • Paragraph 6 on 'Related legal instruments and policy documents', subject to the modifications in paragraph 1.4 of this Policy Document • Paragraph 8 on 'Level of application'
Capital Adequacy Framework for Islamic Banks (Capital Components) issued on 14 June 2024 ("CAFIB CC PD") and as may be amended by the Bank	• Paragraph 2 on 'Applicability' • Paragraph 3 on 'Legal Provisions' • Paragraph 5 on 'Interpretation' subject to paragraph 3 of this Policy Document • Paragraph 6 on 'Related legal instruments and policy documents', subject to the modifications in paragraph 1.4 of this Policy Document • Paragraph 8 on 'Level of application'

[1] *Basel Framework (CRE50* to *CRE52*, *CRE55)*. https://www.bis.org/basel_framework/standard/CRE

1.4 This Policy Document shall be read together with the policy documents as set out in paragraph 1.3 of this Policy Document, the Bank's policy document on the *Capital Adequacy Framework (Exposures to Central Counterparties)* ("CAF CCP PD"), *Capital Adequacy Framework (Standardised Approach for Credit Risk)* ("SACR PD") and other relevant legal instruments, policy documents and guidelines that have been issued by the Bank, including any amendments or reissuance thereafter.

Question 1: Interlinkages between SA-CCR and other Basel III frameworks

The SA-CCR methodology would have an impact on the calculation of a financial institution's capital adequacy ratios as well as other regulatory frameworks such as *Large Exposures Limit* (which would replace the *Single Counterparty Exposure Limit*) and *Leverage Ratio*.

In this regard, please share the expected impact (direction and magnitude) on the adoption of SA-CCR on your institution's risk-weighted assets for derivative contracts (i.e. move to SA-CCR from CEM), compliance with the large exposures limit, and leverage ratio. These views should be informed by the SA-CCR Quantitative Impact Study (QIS), which was issued to all banking institutions on 30 May 2025.

Question 2: Implications on financial institutions' derivatives business

The implementation of SA-CCR is expected to result in varying implications on financial institutions' derivatives business across different types of counterparties. The implications could be in the form of product offerings (e.g. tenor of products), pricing, signing of netting agreements and collateral arrangements (e.g. signing of margin agreements, increase in frequency of collateral exchanges).

In view of the above, does your institution foresee:

(a) the need to re-evaluate products or counterparties due to higher capital cost;
(b) whether there are any counterparty segments that could be adversely affected by the adoption of SA-CCR (e.g. large corporates or small and medium enterprises (SME) as well as the type of economic sectors); and the nature of derivatives trades that these counterparty segments would usually have (e.g. interest rate swaps, FX forwards);
(c) the need to review your institution's CCR hedging practices with counterparties, including the adoption of netting agreements such as the ISDA Master Agreement; and
(d) the need to reevaluate your institution's strategy in relation to collateral arrangements.

Question 3: Specific implications on Islamic financial institutions
(Applicable to Islamic financial institutions)

Please share any specific challenges that your institution may face in realising the full benefits of SA-CCR, as well as plans in addressing these challenges.

Question 4: Impact on Malaysia's derivatives market

How will SA-CCR and the future implementation of the Basel III capital requirements for credit valuation adjustment (CVA) risk impact market demand for centrally cleared trades, and contribute to the depth and liquidity of Malaysia's derivatives market?

2. Effective date

2.1 Subject to paragraph 2.2, this Policy Document comes into effect on **[DD MM YYYY].**

2.2 Paragraphs 6.2 and 7.3 of this Policy Document shall only come into effect when the framework on the Basic Approach of the Credit Valuation Adjustment ("BA-CVA") capital requirement comes into force.

Question 5: Effective date

The Bank plans to issue the finalised policy document by the first half of 2027, and to specify that the requirements take effect 18 months thereafter.

Would your financial institution be able to comply with the proposed requirements based on this timeline? If not, please suggest an alternative implementation timeline, with clear justification.

3. Interpretation

3.1 The terms and expressions used in this Policy Document shall have the same meanings assigned to them in the Financial Services Act 2013 ("FSA"), Islamic Financial Services Act 2013 ("IFSA"), CAF CC PD, CAFIB CC PD and CAF CCP PD, as the case may be, unless otherwise defined in this Policy Document:

"**S**" denotes a standard, an obligation, a requirement, specification, direction, condition and any interpretative, supplemental and transitional provisions that shall be complied with. Non-compliance may result in enforcement actions;

"**G**" denotes guidance which may consist of statements or information intended to promote common understanding and advice or recommendations that are encouraged to be adopted;

"banking book exposure" refers to an exposure which is not a trading book exposure;

"banking institution" refers to both a banking institution as defined in the CAF CC PD and an Islamic banking institution as defined in the CAFIB CC PD;

"basis transaction" refers to a derivative contract that references the basis between two risk factors[2] and the contract is denominated in a single currency;

"counterparty credit risk exposures" or **"CCR exposures"** refers to any pre-settlement counterparty exposures arising from over-the-counter ("OTC") derivative transactions, exchange-traded derivative transactions, long settlement transactions, securities financing transactions ("SFTs") or Sell and Buyback Agreement ("SBBA")/Reverse SBBA transactions;

"credit valuation adjustment loss" or **"CVA loss"** refers to a credit valuation adjustment ("CVA") which has already been recognised by the financial institution as an incurred write-down;

"derivative contract" refers to an OTC derivative transaction, an exchange-traded derivative transaction or a long settlement transaction;

"financial institution" refers to both a financial institution as defined in the CAF CC PD and an Islamic financial institution as defined in the CAFIB CC PD;

"hedging set" refers to a set of transactions within a single netting set within which full or partial offsetting is recognised for the purpose of calculating the potential future exposure under the SA-CCR;

[2] Examples of specific bases include three-month Libor versus six-month Libor, three-month Libor versus three-month T-Bill, one-month Libor versus overnight indexed swap rate, and Brent Crude oil versus Henry Hub gas.

"independent collateral" refers to–

(a) collateral posted in relation to derivative contracts (other than variation margin) by one counterparty to the second counterparty that may be seized upon the default of the first counterparty to offset losses on the netting set; and

(b) the amount of which the first counterparty is required to post does not change in response to the market value of the contracts that the collateral secures[3].

For the avoidance of doubt, independent collateral includes, but not limited to, initial margin;

"inflation derivative" refers to a derivative contract referencing an inflation rate;

"margin agreement" refers to a contractual agreement or provisions to an agreement under which one counterparty must supply variation margin to a second counterparty when an exposure of that second counterparty to the first counterparty exceeds a specified level;

"margin threshold" refers to the largest amount of an exposure that remains outstanding until one party has the right to call for variation margin;

"margined transaction" refers to a derivative contract which is covered by a variation margin agreement;

"margined netting set" refers to a netting set that meets the condition set out in paragraph 9.4(b) of this Policy Document;

"net independent collateral amount" or **"NICA"**[4] means the amount of segregated and unsegregated collateral posted by a counterparty to a financial institution, less the amount of unsegregated collateral posted by a financial institution to a counterparty;

"netting set" refers to a group of transactions with a single counterparty that are subject to a legally enforceable bilateral netting arrangement and for which netting is recognised under paragraph 8 of this Policy Document. Each transaction that is not subject to a legally enforceable bilateral netting arrangement that is recognised for regulatory capital purposes shall be interpreted as its own netting set;

"settled-to-market contract" refers to a derivative contract that is structured such that any outstanding exposure is settled on specified payment dates and the terms are reset so that the mark-to-market value of the contract is zero on those specified dates;

"Shariah-compliant derivative transaction" refers to a derivative transaction that is structured using Shariah contracts;

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[3] The amount of independent collateral can change in response to factors such as the value of the collateral or a change in the number of transactions in a netting set.

[4] NICA represents the amount of independent collateral that a financial institution may use to offset its exposure on the default of the counterparty.

"risk factor" refers to a market variable that affects the price of a derivative contract, including, but not limited to, an interest/profit rate, an exchange rate, a credit spread, an equity price or a commodity price;

"trading book exposure" refers to an exposure consisting of positions in financial instruments and commodities held either with trading intent or to hedge other elements of the trading book, as defined in paragraphs 5.24 to 5.31 of the policy document on *Capital Adequacy Framework (Basel II – Risk Weighted Assets*) ("CAF RWA PD") and paragraphs 5.23 to 5.30 of the policy document on *Capital Adequacy Framework for Islamic Banks (Risk-Weighted Assets)* ("CAFIB RWA PD");

"tranched credit protection" refers to a credit protection under which–

(a) one counterparty transfers a portion of the credit risk exposure in at least one tranche to at least one other counterparty, and retains the remaining portion of the credit risk of the exposure; and

(b) the portion transferred and the portion retained are of different seniority;

"unmargined transaction" refers to a derivative contract which is a settled-to-market contract or not covered by a variation margin agreement;

"unmargined netting set" refers to a netting set that meets the condition set out in paragraph 9.4(c) of this Policy Document;

"variation margin" or **"VM"** refers to a funded collateral in relation to a margin agreement where the collateral is posted by one counterparty to the second counterparty, or exchanged between the two counterparties, on a regular basis based upon price movements of their transactions; and

"volatility transaction" refers to a derivative contract that references the volatility of a risk factor[5].

[5] Examples of volatility transactions include variance and volatility swaps, and options on realised or implied volatility.

4. Policy documents superseded

4.1 This Policy Document supersedes[6] the following:

(a) Part D.1.4 and Appendix VIII of the policy document on *Capital Adequacy Framework (Basel II – Risk-Weighted Assets)* issued on 18 December 2023; and

(b) Part D.1.4 and Appendix VI of the policy document on *Capital Adequacy Framework for Islamic Banks (Risk-Weighted Assets)* issued on 18 December 2023.

[6] For the avoidance of doubt, the Bank will revise the SACR PD to align with this Policy Document specifically on the computation of counterparty credit risk capital requirements. The revised SACR PD will come into force concurrently with this Policy Document.

PART B GENERAL REQUIREMENTS

5. Scope of CCR capital charge

S 5.1 A financial institution shall identify all transactions in the following categories that give rise to counterparty credit risk and calculate the counterparty credit risk capital charge for both banking book exposures and trading book exposures[7]:
(a) OTC derivative transactions;
(b) Exchange-traded derivative transactions;
(c) Long settlement transactions[8];
(d) Securities financing transactions (SFTs); and
(e) Sell and Buyback Agreement (SBBA)/Reverse SBBA transactions[9].

S 5.2 A financial institution shall not subject the exposures arising from the settlement of cash transactions in equities, fixed income, spot foreign exchange and spot commodities (including those to central counterparties) to the requirements in this Policy Document as these exposures are not scoped as counterparty credit risk exposures. For the avoidance of doubt, the financial institution shall ensure that the settlement of these transactions remains subject to the capital treatment for unsettled transactions and failed trades set out in Appendix 5 of the SACR PD.

G 5.3 Counterparty credit risk creates a bilateral risk of loss, where the market value of the transaction can be positive or negative to either counterparty to the transaction. The market value is uncertain and can vary over time with the movement of underlying market factors. A more detailed description relating to counterparty credit risk is provided in Appendix 1.

6. Methods to calculate the CCR exposure value

S 6.1 A financial institution shall calculate the exposure value of CCR banking book and CCR trading book exposures. For a given counterparty, the exposure value is the sum of the exposure values calculated for each netting set with the counterparty. Where transactions with that counterparty consists of at least one OTC derivative transaction, the CCR exposure value for the counterparty shall be determined as the greater of:
(a) zero; and
(b) the difference between the sum of CCR exposure values across all netting sets with that counterparty and the CVA loss. The calculation of the CVA loss must not include any offsetting debit valuation adjustments[10].

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7 For the avoidance of doubt, the CCR capital charge is separate from the market risk capital requirements.

8 This includes foreign exchange spot contracts and primary issuance of bond transactions which have settlement date longer than the lower of: (i) market standard; or (ii) five business days.

9 For the avoidance of doubt, SBBA and reverse SBBA are not securities financing transactions. Instead, SBBA and reverse SBBA consists of outright sale/buy contract as well as forward transactions as *wa'd* (promise) to buyback/sellback.

10 This is because the debit valuation adjustment has been already deducted from the CET1 Capital, in accordance with paragraph 28.2 of the CAF CC PD and paragraph 28.2 of the CAFIB CC PD.

S 6.2 A financial institution shall not apply the CVA loss to reduce the CCR exposure value in the calculation of the CVA capital requirement.

S 6.3 In the case of CCR exposures cleared through a central counterparty, a financial institution must apply the methods set out in the CAF CCP PD.

S 6.4 In the case of CCR exposures not cleared through a central counterparty, a financial institution shall calculate the CCR exposure value by applying–

(a) the SA-CCR set out in Part C of this Policy Document, for exposures arising from OTC derivative transactions, exchange-traded derivative transactions, long settlement transactions and forward purchase transaction of SBBA/Reverse SBBA transactions; or

(b) the simple approach or comprehensive approach for collateralised transactions as set out in paragraph 49 of the SACR PD, for SFTs.

G 6.5 With respect to the calculation of CCR exposure values for SFTs in the trading book, a financial institution may use all instruments in the trading book as eligible collateral.

S 6.6 With respect to paragraph 6.5, a financial institution shall apply the supervisory haircuts as set out in paragraph 49.33 of the SACR PD to the eligible collateral. Where the instruments in the trading book fall outside the list of instruments in that paragraph, such instruments must be subject to a haircut at the level applicable to other equities listed on a recognised exchange (i.e. 30%).

S 6.7 Notwithstanding paragraphs 6.1, 6.3 and 6.4, a financial institution shall only be allowed to treat the CCR exposure value as zero for the following scenarios in credit derivatives transactions:

(a) the financial institution is the protection buyer in a credit derivative (e.g. issuer of a credit-linked note)[11] and the credit risk mitigation effect of that credit derivative has been recognised in the calculation of the credit RWA under the Standardised Approach for Credit Risk or the Internal Ratings-Based (IRB) approach; or

(b) the financial institution is the protection seller in credit default swap (e.g. investor for a credit-linked note), where the credit default swap is designated into the banking book and therefore subject to the credit risk capital requirement for the full notional amount.

Question 6: Revised treatment on credit risk mitigation

The BCBS has recently issued a technical amendment on the treatment of CCR exposures that are hedged through guarantees or credit derivatives[12]. The Bank intends to incorporate the revised treatment when finalising this Policy Document.

Please share whether your financial institution would face any issues together with the relevant examples to apply the revised treatment.

[11] The protection may be purchased against a banking book exposure, or against a CCR exposure.

[12] *Hedging of counterparty credit risk exposures*, October 2025. https://www.bis.org/bcbs/publ/d600.pdf

7. Methods to calculate the CCR risk-weighted assets (RWA)

S 7.1 A financial institution shall determine the CCR RWA for centrally cleared exposures in the banking book and the trading book by multiplying the CCR exposure value as stipulated in paragraph 6 of this Policy Document with the appropriate risk weight in the CAF CCP PD.

S 7.2 In the case of a CCR banking book exposure and CCR trading book exposure that are not centrally cleared, a financial institution shall determine the CCR RWA by using either of the following applicable approach:

(a) for a counterparty to which the Standardised Approach for Credit Risk is applied, the CCR exposure value set out in paragraph 6 of this Policy Document shall be multiplied with the relevant risk weight of the counterparty; or

(b) for a counterparty to which the IRB approach is applied, the CCR exposure value set out in paragraph 6 of this Policy Document shall be used within the IRB approach to determine the RWA and expected loss amounts.

S 7.3 With respect to paragraph 7.2(b) of this Policy Document, a financial institution that adopts the IRB approach for a given counterparty, shall cap the "full maturity adjustment" at the value of "1" when calculating the CCR RWA for each netting set that the financial institution calculates the CVA capital requirement under either the basic approach ("BA-CVA") or the standardised approach ("SA-CVA")[13].

8. Bilateral netting

G 8.1 A financial institution may recognise a bilateral netting agreement with the following arrangements towards calculating the capital requirements:

(a) the transactions are subject to novation under which any obligation between the two counterparties to deliver a given currency on a given value date are automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single amount for the previous gross obligations; or

(b) the transactions are subject to any legally valid form of bilateral netting not covered in paragraph 8.1(a) of this Policy Document, including other forms of novation.

S 8.2 A financial institution shall recognise a bilateral netting agreement between the financial institution and a counterparty containing transactions in only one of the following product categories[14]:

(a) OTC derivatives transaction or long settlement transaction; or

(b) securities financing transactions (SFTs).

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[13] For the avoidance of doubt, there is currently no prevailing Pillar 1 capital requirements for CVA. The capital requirements will be issued in due course.

[14] Bilateral netting agreement containing transactions in more than one product category shall not be recognised for regulatory capital purposes.

S 8.3 A financial institution shall comply with the requirements stipulated in paragraph 49.27 of the SACR PD to apply the netting agreement for SFTs in the calculation of capital requirements.

S 8.4 For transactions under paragraph 8.2(a), a financial institution must be able to satisfy the Bank upon request[15] that the financial institution complies with the following conditions to effect the bilateral netting agreement in the calculation of capital requirements:

(a) the netting agreement creates a single legal obligation for all transactions covered by the agreement such that the financial institution would have either–
   (i) a claim to receive; or
   (ii) an obligation to pay,
   only the net sum of positive and negative mark-to-market values of the included individual transactions in the event a counterparty fails to perform due to default, bankruptcy, liquidation or similar circumstances;

(b) the netting agreement must not contain any clause, in which the event of a default of a counterparty permits a non-defaulting counterparty to make–
   (i) limited payments only; or
   (ii) no payments at all,
   to the estate of the defaulter, even if the defaulter is a net creditor;

(c) the financial institution has obtained written and reasoned legal opinions that, in the event of a legal challenge, the relevant courts and administrative authorities would find that the financial institution's exposures to be of such net amount as stipulated in paragraph 8.4(a) of this Policy Document under:
   (i) the law of the jurisdiction in which the counterparty is chartered and if the foreign branch of a counterparty is involved, the law of the jurisdiction in which the branch is located;
   (ii) the law that governs the individual transactions; and
   (iii) the law that governs any contract or agreement necessary to effect the netting; and

(d) the financial institution has established procedures to ensure that the legal characteristics of the netting agreement are subject to review where there are any developments to the relevant law.

S 8.5 If the Bank is not satisfied about the enforceability of the netting agreement under the laws of each of the relevant jurisdictions in paragraph 8.4(c) of this Policy Document after consultation with other relevant supervisory authorities when necessary, a financial institution shall not–

(a) deem the netting agreement as meeting the conditions in paragraph 8.4 of this Policy Document; and

(b) recognise the netting agreement for the regulatory capital purposes.

[15] For the avoidance of doubt, a financial institution is not required to obtain prior approval from the Bank to recognise the bilateral netting agreement.

PART C OVERVIEW OF SA-CCR

9. Overarching framework

S 9.1 A financial institution must determine the CCR exposure value of derivative contracts for each netting set separately. Where a transaction is not subject to a legally enforceable bilateral netting agreement that is recognised in the calculation of capital requirements, the transaction shall be treated as its own netting set.

G 9.2 Where Shariah-compliant derivative transactions are subject to a legally enforceable bilateral netting agreement that is recognised in the calculation of capital requirements and the netting agreement exclusively consists of Shariah-compliant derivative transactions, these transactions can be treated as its own netting set.

S 9.3 Subject to paragraphs 9.10 and 10 of this Policy Document, a financial institution shall compute the CCR exposure value of derivative contracts for each netting set in the following manner:

$$\text{Exposure value} = \text{Alpha} \times (\text{RC} + \text{PFE})$$

Where–
(a) Alpha is set at 1.4;
(b) RC is the replacement cost calculated in accordance with paragraph 12 of this Policy Document; and
(c) PFE is the amount of potential future exposure calculated in accordance with paragraphs 14 to 24 of this Policy Document.

S 9.4 With respect to paragraph 9.3 of this Policy Document, a financial institution shall determine whether each netting set is a margined netting set or an unmargined netting set by applying the following:
(a) the distinction of “margined” or “unmargined” is unrelated to the requirement to post initial margin for the covered transactions;
(b) a margined netting set is a netting set where the transactions are covered by a margin agreement under which the financial institution would receive variation margin; and
(c) an unmargined netting set is a netting set where the transactions are not covered by a margin agreement. For the avoidance of doubt, a netting set subjected to a one-way margin agreement where only the financial institution would post variation margin must be deemed as an unmargined netting set.

S 9.5 A financial institution must calculate RC and PFE differently for margined and unmargined netting sets. Subject to paragraph 9.4(c) of this Policy Document, the methodology for margined netting sets shall be applicable to both centrally cleared transactions and bilateral transactions covered by a margin agreement.

G 9.6 For unmargined transactions, the RC intends to capture the loss that would occur if a counterparty were to default and were closed out of its transactions immediately. On the other hand, the PFE add-on (which is set out in paragraphs 14 to 24 of this Policy Document) represents a potential conservative increase in exposure during the one-year period.

G 9.7 For margined transactions, the RC intends to capture the loss that would occur if a counterparty were to default, but accounts for the period between the last exchange of collateral before default and replacement of the trades in the market (i.e. the margin period of risk). The PFE add-on represents the potential change in value of the trades during the period.

S 9.8 A financial institution shall ensure that the exposure value for a margined netting set must be capped at the exposure value of the same netting set calculated on an unmargined basis[16].

S 9.9 A financial institution shall only decompose a transaction in a netting set where the payoff can be represented as a portfolio of individual transactions (e.g. an interest rate cap is a combination of interest rate caplets)[17]. The decomposition must result in the same set of cash flows.

S 9.10 A financial institution shall only apply the following treatment if the transaction is not under a qualifying bilateral netting and margin agreement, or is deemed to be treated as an individual unmargined transaction where the transaction is removed from the original netting set:

(a) for a credit derivative with periodic premium payments and the financial institution is the protection seller, the exposure value shall be capped at the amount of unpaid premia; and

(b) for a sold option of the financial institution where the premium for the option has been fully paid upfront by the counterparty, the exposure value shall be set at zero.

10. Treatment of multiple margin agreements and multiple netting sets

G 10.1 The SA-CCR generally follows the variation margin set-up where either the entire netting set consists exclusively of unmargined trades, or exclusively of margined trades covered by the same variation margin agreement. Notwithstanding this, the framework has also prescribed a dedicated treatment where–

(a) the netting set consists of both margined and unmargined transactions;

(b) the netting set consists of margined transactions covered by more than one margin agreement[18]; or

(c) the margined transactions are covered by different netting agreements.

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16 The cap is binding in certain margined netting sets, such as those comprising short-term transactions with a residual maturity of 10 business days or less.

17 Decomposition of linear products (e.g. plain vanilla interest or profit rate swap) is not allowed.

18 For example, this may arise due to Shariah-compliant derivative transactions that are subject to different margin agreements within the same netting set such as the ISDA/IIFM (International Islamic Financial Market) 2017 Credit Support Deed for Cash Collateral (VM) and the Malaysian Credit Support Annex to the ISDA-IIFM *Tahawwut* Master Agreement for Cash Collateral (VM).

S 10.2 Where the netting set consists of either the set-up in paragraph 10.1(a) or 10.1(b) of this Policy Document, a financial institution must divide the netting set into sub-netting sets that align with their respective margin agreement. This shall be applicable to the calculation of both RC as set out in paragraph 12.5 and PFE in paragraph 14.2.

S 10.3 If a single margin agreement applies to several netting sets, a financial institution shall observe the following treatment[19]:

(a) in calculating the RC, the financial institution shall apply the treatment set out in paragraph 12.6 of this Policy Document, where the unmargined current exposure is aggregated across all netting sets and the treatment is based on whether the financial institution is either a net holder of the collateral or a net poster of the collateral; and

(b) in calculating the PFE, the financial institution shall apply the methodology for unmargined transactions to calculate the PFE add-on for each netting set, and this is aggregated as a simple sum for all netting sets. The allocation of collateral for purposes of the PFE calculation shall be in accordance with paragraph 15.2 of this Policy Document.

11. Treatment of collateral taken outside of netting sets

S 11.1 In cases where eligible collateral is received to offset losses on exposures determined using the SA-CCR as well as other exposures (e.g. those calculated under the SACR PD), a financial institution shall only use the portion of the collateral assigned to the derivative contracts to reduce the CCR exposure value.

S 11.2 If an eligible collateral taken outside a netting set is available to offset CCR losses on one netting set only, a financial institution must treat the collateral as an independent collateral associated with the netting set.

S 11.3 If an eligible collateral taken outside a netting set is available to offset CCR losses on more than one netting set, a financial institution must apply the treatment for the collateral as set out in paragraph 10.3 of this Policy Document.

[19] A dedicated SA-CCR treatment needs to be set out for this arrangement due to the problem of allocating the common collateral to individual netting sets.

PART D REPLACEMENT COST

12. Approaches to calculate RC

S 12.1 A financial institution shall determine the RC for an unmargined netting set by using the following formula:

$$RC = \max (V - C ; 0)$$

Where–

(a) V is the current mark-to-market value of the derivative contracts in the netting set; and

(b) C is the haircut value of net collateral held for the netting set, which must be calculated using the net independent collateral amount methodology as set out in paragraph 13 of this Policy Document.

S 12.2 A financial institution shall determine the RC through the following formula for a margined netting set, which is applicable to bilateral transactions and to central clearing relationships:

$$RC = \max (V - C ; TH + MTA - NICA ; 0)$$

Where–

(a) V is the current mark-to-market value of the derivative contracts in the netting set;

(b) C is the haircut value of net collateral held (i.e. the net variation margin and the net independent collateral) for the netting set, which must be calculated in accordance with paragraph 13 of this Policy Document;

(c) TH is the margin threshold where the counterparty must post the collateral to the financial institution;

(d) MTA is the minimum transfer amount applicable to the counterparty; and

(e) NICA is the haircut value of the net independent collateral amount which shall be calculated in accordance with paragraph 13 of this Policy Document.

G 12.3 The RC for a margined netting set is defined as the greatest exposure that would not trigger a call for variation margin, considering the mechanics of collateral exchanges in margining agreements such as "Threshold", "Minimum Transfer Amount" and "Independent Amount" [20]. While the RC formula factors into the mechanics on the call for VM under the standard industry documentation[21], a generic formula has been created to reflect the variety of margining approaches used in the industry and those being considered by supervisory authorities globally.

G 12.4 Illustrative examples on the effect of standard margin agreements towards the SA-CCR computation are provided in Appendix 2. The calculation of RC is floored at zero, recognising that a financial institution may hold NICA in excess of TH and MTA.

S 12.5 Where a netting set consists of the set-up in either paragraph 10.1(a) or 10.1(b) of this Policy Document, a financial institution shall calculate the RC for the entire netting set via the formula set out in paragraph 12.2 and apply the following adjustments to the terminologies:

(a) V is the current mark-to-market value of all derivative contracts (both margined and unmargined) in the netting set;

(b) C is the haircut value of net collateral held by the financial institution (i.e. the net independent collateral and the net variation margin) for all derivative contracts within the netting set and are to be computed in accordance with paragraph 13 of this Policy Document;

(c) TH is the sum of the counterparty margin thresholds across all variation margin agreements within the netting set; and

(d) MTA is the sum of the minimum transfer amounts across all variation margin agreements within the netting set.

S 12.6 In the case of the set-up in paragraph 10.1(c) of this Policy Document, a financial institution shall calculate the RC as the sum of the two following terms and each term is to be calculated across all netting sets covered by the margin agreement:

$$RC_{MA}=\max\left\{\sum_{NS\in MA}\max\{V_{NS};0\}-\max\{C_{MA};0\};0\right\}+\max\left\{\sum_{NS\in MA}\min\{V_{NS};0\}-\min\{C_{MA};0\};0\right\}$$

[20] For example, the 1992 (Multicurrency-Cross Border) Master Agreement and the 2002 Master Agreement published by the International Swaps & Derivatives Association, Inc. (ISDA Master Agreement). The ISDA Master Agreement includes the ISDA Credit Support Annexes: the 1994 Credit Support Annex (Security Interest – New York Law), or, as applicable, the 1995 Credit Support Annex (Transfer – English Law) and the 1995 Credit Support Deed (Security Interest – English Law). Specifically for Shariah-compliant derivative transactions, the applicable examples are the ISDA/IIFM 2017 Credit Support Deed for Cash Collateral (VM) and the Malaysian Credit Support Annex to the ISDA-IIFM *Tahawwut* Master Agreement for Cash Collateral (VM).

[21] For example, in the ISDA Master Agreement, the term "Credit Support Amount", or the overall amount of collateral that must be delivered between the parties, is defined as the greater of the Secured Party's Exposure plus the aggregate of all Independent Amounts applicable to the Pledgor minus all Independent Amounts applicable to the Secured Party, minus the Pledgor's Threshold and zero.

Where–

(a) RC_{MA} is the replacement cost of the entire margin agreement MA;
(b) $NS \in MA$ refers to the netting sets covered by the margin agreement MA;
(c) V_{NS} is the current mark-to-market value of the netting set NS; and
(d) C_{MA} is the haircut value of net collateral held by the financial institution (net variation margin and net independent collateral) under the margin agreement MA which must be determined according to paragraph 13 of this Policy Document.

G 12.7 With respect to the RC formula in paragraph 12.6 of this Policy Document–

(a) the first term is equal to the unmargined current exposure of the financial institution to the counterparty aggregated across all netting sets within the margin agreement reduced by the positive current net collateral (i.e. collateral is subtracted only when the financial institution is a net holder of the collateral); and
(b) the second term is equal to the current net posted collateral reduced by the unmargined current exposure of the counterparty to the financial institution aggregated across all netting sets within the margin agreement (i.e. the term is non-zero only when the financial institution is the net poster of the collateral).

13. Haircut value of net collateral held

G 13.1 One objective of the SA-CCR is to reflect the effect of margining agreements and the associated exchange of collateral in the calculation of CCR exposure value. To avoid confusion surrounding the terms initial margin and independent amount which may be used interchangeably, the policy document introduces the term “independent collateral”. This term includes the Independent Amount (“IA”) parameter as defined in the standard industry documentation.

S 13.2 A financial institution must determine the haircut using the formula specified in paragraph 49.41 of the SACR PD, subject to a cap of 100%. In applying the formula–

(a) for unmargined transactions, the parameter N_R (i.e. actual number of business days between re-margining for capital market transactions) must be set as the number of business days for the longest transaction in the netting set, capped at 250 days; and
(b) for margined transactions, the parameter T_M refers to the margin period of risk as determined in paragraphs 18.14 to 18.19[22] of this Policy Document.

S 13.3 A financial institution shall apply the haircut derived as according to paragraph 13.2 of this Policy Document to reduce the amount of collateral received from the counterparty and to increase the amount of collateral posted to the counterparty.

[22] For the avoidance of doubt, the parameter N_R shall be set equal to one for margined transactions as the MPOR has already accounted for number of business days between re-margining.

S 13.4 In deriving the net variation margin held as well as the net independent collateral held, a financial institution shall–

(a) comply with paragraphs 49.9 and 49.10 of the SACR PD to recognise the collateral received from the counterparty;

(b) account the amount received from the counterparty with a positive sign and the amount posted to the counterparty with a negative sign[23]; and

(c) exclude the collateral posted to a segregated, bankruptcy-remote account from the calculation of net independent collateral amount[24].

[23] For a netting set consisting of one-way margin agreement in favour of the counterparty (i.e. the financial institution posts, but does not receive variation margin), the collateral is accounted with a negative sign as this reflects the variation margin amount posted by the financial institution to the counterparty.

[24] With respect to IA, NICA takes into account the differential of IA required for the financial institution minus the IA required for the counterparty.

PART E POTENTIAL FUTURE EXPOSURE

14. PFE formula

S 14.1 A financial institution shall determine the PFE for an unmargined netting set as well as a margined netting set by using the following formula:

$$PFE = multiplier \times AddOn^{aggregate}$$

Where–

(a) multiplier is a factor calculated in accordance with paragraph 15 of this Policy Document; and

(b) $AddOn^{aggregate}$ is the aggregate add-on component as set out in paragraph 16 of this Policy Document.

S 14.2 In the case of a netting set consisting of either set-up in paragraph 10.1(a) or 10.1(b) of this Policy Document, a financial institution must calculate the PFE for the netting set as per the formula in paragraph 14.1 of this Policy Document. The aggregate add-on for the netting set is computed as the sum of the aggregated add-ons for each sub-netting set, where–

(a) all unmargined transactions within the netting set constitute a single sub-netting set; and

(b) all margined transactions sharing the same margin period of risk (MPOR) within the netting set constitute a single sub-netting set.

S 14.3 If the margined transactions are set-up under paragraph 10.1(c) of this Policy Document (i.e. different netting agreements), a financial institution shall compute the PFE according to the unmargined netting set methodology[25] and the netting set-level PFE must be aggregated using the following formula:

$$PFE_{MA} = \sum_{NS \in MA} PFE_{NS}^{(unmargined)}$$

Where–

(a) PFE_{MA} is the potential future exposure of the entire margin agreement MA;

(b) $NS \in MA$ refers to the netting sets covered by the margin agreement MA; and

(c) $PFE_{NS}^{(unmargined)}$ is the PFE of the netting set NS.

[25] This treatment accounts for the collateral exchanged being netted across all transactions covered under the margin agreement, irrespective of the netting sets, and that the collateral may not be sufficient to cover the PFE.

15. Multiplier

S 15.1 A financial institution shall calculate the multiplier by using the following formula:

$$\text{multiplier} = \min\left\{1\ ;\ \text{Floor} + (1 - \text{Floor} \times \exp\left(\frac{V - C}{2 \times (1 - \text{Floor}) \times \text{AddOn}^{\text{aggregate}}}\right)\right\}$$

Where–

(a) Floor is 5%;

(b) exp(…) is the exponential function;

(c) V is the current mark-to-market value of the derivative contracts as set out in paragraph 12.1(a), 12.2(a), 12.5(a) or 12.6(c) of this Policy Document, as the case may be;

(d) C is the haircut value of net collateral held specified in paragraph 12.1(b), 12.2(b), 12.5(b) or 12.6(d) of this Policy Document, as the case may be; and

(e) $\text{AddOn}^{\text{aggregate}}$ is the aggregate add-on component that is to be calculated in accordance with paragraph 16 of this Policy Document.

S 15.2 Where the transactions are structured according to paragraph 10.1(c) of this Policy Document, a financial institution must allocate the haircut value of net collateral held (i.e. the amount C as set out in paragraph 12.6(d) of this Policy Document) to the netting sets as follows:

(a) if the financial institution is a net receiver of collateral (C > 0), the amount to be allocated to the individual netting sets must be positive or zero. Netting sets with positive mark-to-market values must be first allocated collateral up to the amount of those values. The surplus collateral shall only be attributed freely among all netting sets after all positive mark-to-market values have been compensated;

(b) if the financial institution is a net provider of collateral (C < 0), the amount to be allocated to the individual netting sets must be negative or zero. Netting sets with negative mark-to-market values must be first allocated collateral up to the amount of those values. If the collateral provided is larger than the sum of negative mark-to-market values[26], the financial institution must set the multipliers for all netting sets equal to one; and

(c) the financial institution must ensure that the allocated collaterals add up to C.

G 15.3 The multiplier to the PFE component accounts for the current net mark-to-market value of derivative contracts and the net collateral held by a financial institution. The multiplier is equal to one when the trades are under-collateralised at that point in time, whereas the multiplier is less than one when the trades are over-collateralised. The multiplier would decrease as the excess collateral increases, but without reaching zero as the factor is floored at 5%.

[26] For example, C is –10 and the sum of negative mark-to-market values is –5.

16. Aggregate add-on

S 16.1 A financial institution shall calculate the add-ons for the following asset classes within the netting set:
(a) Interest/profit rate derivatives[27];
(b) Foreign exchange derivatives;
(c) Credit derivatives;
(d) Equity derivatives; and
(e) Commodity derivatives.

S 16.2 A financial institution must not recognise diversification benefits of the add-ons across asset classes. Instead, the financial institution shall ensure that the respective add-ons for each asset class are aggregated as a simple summation across the asset classes, as follows:

$$\text{AddOn}^{\text{aggregate}} = \sum_{\text{Asset class}} \text{AddOn}^{(\text{assetclass})}$$

Where–
(a) Asset class refers to those specified in paragraph 16.1 of this Policy Document; and
(b) $\text{AddOn}^{(\text{assetclass})}$ is the add-on for each asset class, that is to be calculated in accordance with paragraphs 20 to 24 of this Policy Document.

G 16.3 While the formulas for each asset class add-ons would differ, the following general steps would apply in the calculation of asset class add-on:
(a) designate each derivative contract to the appropriate asset class (or classes) based on the requirements in paragraph 17 of this Policy Document;
(b) calculate the effective notional for each derivative contract according to the specifications in paragraph 18 of this Policy Document;
(c) group the trades within the asset class whereby only the long and short positions within the group are permitted to offset each other, and identify the appropriate supervisory factor; and
(d) apply the aggregation formulas to aggregate the effective notionals and supervisory factors across trades within each hedging set, and finally at the asset-class level. In the case of credit derivatives, equity derivatives and commodity derivatives asset classes, the aggregation also involves the use of supervisory correlation parameters to capture diversification of trades and basis risk.

[27] Includes both derivative contracts where interest rate is the primary risk factor, as well as Shariah-compliant derivative transactions where profit rate or rate of return is the primary risk factor.

17. Allocation of derivative contracts into asset classes

S 17.1 Subject to paragraphs 17.3 and 17.5 of this Policy Document, a financial institution shall allocate the asset class (or classes) for a derivative contract based on the determination of its primary risk factor as follows:

(a) when the derivative contract has one primary risk factor that is defined by its reference underlying instrument[28], the contract must be designated into only one of the asset classes as specified in paragraph 16.1 of this Policy Document; and

(b) for a transaction with more than one risk factor[29], the financial institution must take the sensitivities and volatility of the underlying instrument into account to determine the transaction's primary risk factor.

G 17.2 Derivative contracts that are commonly traded in the market would usually have one risk factor which most significantly affects the mark-to-market value of the contract. In this regard, a derivative contract is expected to be assigned to only one asset class unless the contract has another equally important risk factor.

S 17.3 A financial institution shall apply the following in classifying specific contracts:

(a) a bond transaction that is a long settlement transaction must be assessed as to whether the transaction is classified into the interest/profit rate derivatives asset class or the credit derivatives asset class based on its own determination of the primary risk factor of the transaction; and

(b) a derivative contract which has an inflation rate as the primary risk factor must be designated to the interest/profit rate derivatives asset class.

G 17.4 If the Bank views that classifying a derivative contract into only one asset class would understate the contract's CCR exposure, the Bank may communicate in writing to require a financial institution to allocate the contract to more than one asset class.

S 17.5 Where the Bank requires a financial institution to allocate a derivative contract to more than one asset class based on the Bank's views as described in paragraph 17.4, the financial institution shall comply with the requirement.

S 17.6 Unless specified otherwise by the Bank, the financial institution must determine appropriately the sign and the supervisory delta adjustment for each asset class to which the position is allocated.

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[28] For example, an interest rate curve is the primary risk factor for an interest rate swap, a reference entity is the primary risk factor for a credit default swap and a foreign exchange rate is the primary risk factor for a foreign exchange call option. Accordingly, a derivative transaction with two floating legs that are denominated in different currencies (such as cross-currency swaps) shall be allocated to the foreign exchange asset class.

[29] This applies to transactions that are more complex, such as multi-asset derivative transactions and hybrid derivative transactions.

18. Calculation of effective notional

G 18.1 The effective notional is a measure of the sensitivity of the derivative contract to movements in the underlying risk factors.

S 18.2 A financial institution must calculate the effective notional for each derivative contract as the product of the following parameters:

$$D = d \times MF \times \delta$$

Where–

(a) D is the trade-level effective notional;

(b) d is the adjusted notional, which is a measure of the size of the trade and its maturity dependency[30];

(c) MF is the maturity factor, of which the calculation depends on whether the contract is unmargined or margined; and

(d) δ is the supervisory delta adjustment, which captures the trade direction and whether the trade has a non-linear relationship with the underlying risk driver, particularly in the case of an option or a tranched credit protection.

Adjusted notional

S 18.3 For a derivative contract either classified into the interest/profit rate derivatives asset class or the credit derivatives asset class, a financial institution shall compute the trade-level adjusted notional as the product of the trade notional amount (converted to Ringgit, where necessary) and the supervisory duration as calculated according to paragraphs 18.4 and 18.5 of this Policy Document.

S 18.4 A financial institution shall determine the supervisory duration of the derivative contract using the following formula:

$$SD_i = \frac{\exp(-0.05 \times S_i) - \exp(-0.05 \times E_i)}{0.05}$$

Where–

(a) SD_i is the supervisory floor of the contract, subject to a floor of 10 business days;

(b) S_i is the time period (expressed in years) from the current date until the start date of the time period referenced by the contract, or zero if the start date has occurred[31]; and

[30] For derivative contracts in the interest/profit rate derivatives and the credit derivatives asset classes, the notional amount is adjusted by a measure of the duration of the instrument to account for the fact that the value of contracts with longer durations are more sensitive to movements in the underlying risk factors (i.e. interest/profit rates and credit spreads).

[31] For example, an ongoing interest or profit rate swap.

(c) E_i is the time period (expressed in years) from the current date until the end date of the period referenced by the contract.

S 18.5 In determining the parameters S_i and E_i as defined in paragraphs 18.4(b) and 18.4(c) of this Policy Document, respectively, a financial institution shall account for the distinction between the time period of the underlying instrument and the remaining maturity of the derivative contract as follows:

(a) if the derivative contract references the value of another interest/profit rate or credit instrument[32], S_i and E_i must be set on the basis of the underlying instrument of the contract[33]; and

(b) in the case where the derivative contract is a Bermudan swaption, S_i must be set as the time period from the current date to the earliest allowed exercise date whereas E_i must be set as the time period from the current date to the end date of the underlying swap.

G 18.6 Examples of transactions, including each transaction's related start date (S_i) and end date (E_i), are provided in Appendix 3.

S 18.7 For a derivative contract assigned to the foreign exchange derivatives asset class, a financial institution must take the adjusted notional as either–

(a) the Ringgit-equivalent trade notional amount of the foreign currency leg of the contract, if one leg of the contract is denominated in Ringgit; or

(b) the larger value of the two Ringgit-equivalent trade notional amounts, if both legs of the contract are denominated in currencies other than Ringgit.

S 18.8 For a derivative contract designated into the equity derivatives asset class or the commodity derivatives asset class, a financial institution must determine the adjusted notional as the product of the current price of one unit of the stock or the commodity[34] and the number of units referenced by the contract. In the case where such contract is a volatility transaction, the financial institution must replace the unit price with the underlying volatility or variance referenced by the transaction, and the number of units with the contractual trade notional amount.

Question 7: Adjusted notional for equity and commodity derivatives

Please share whether your financial institution would face any issues together with the relevant examples to apply the treatment as set out in paragraph 18.8.

S 18.9 In calculating the trade-level adjusted notional amount as set out in paragraphs 18.3 to 18.8 of this Policy Document, a financial institution shall use the notional amount stated in the derivative contract as the trade notional amount when the amount is stated clearly and fixed until maturity. Otherwise, the financial institution shall apply the following in determining the trade notional amount:

[32] For example, a swaption or a bond option.

[33] For example, a European interest rate swaption with expiry of 1 year and the term of the underlying swap of 5 years has S_i = 1 year and E_i = 6 years.

[34] For example, a share of equity or a barrel of oil.

(a) where the stated notional amount is a formula of market values as inputs, the current market values must be used to calculate the trade notional amount;

(b) where a derivative contract is classified into the interest/profit rate derivatives or the credit derivatives asset class, and the contract specifies variable notional amounts[35], the trade notional amount must be calculated by using the average notional over the remaining life of the contract[36]. The average is to be calculated as "time-weighted", where the weight for a notional amount value is the proportion of the time period during which the value applies;

(c) for a leveraged swap, the trade notional amount must be obtained by converting the stated notional amount into the notional amount of an equivalent unleveraged swap. Where all rates in the swap are multiplied by a factor, the trade notional amount is computed by multiplying the stated notional amount with the factor on the rates; and

(d) for a derivative contract with multiple exchanges of principal, the stated notional amount is multiplied by the number of exchanges of principal to arrive at the trade notional amount.

Maturity factor

S 18.10 A financial institution shall obtain the maturity factor for an unmargined transaction using the following formula:

$$MF_i^{(unmargined)} = \sqrt{\frac{\min\{M_i; 1\ year\}}{1\ year}}$$

Where–

(a) $MF_i^{(unmargined)}$ is the maturity factor[37] for the contract; and

(b) M_i is the contract's remaining maturity (expressed in years), subject to the requirements in paragraphs 18.11 and 18.12 of this Policy Document as well as floored at 10 business days.

S 18.11 A financial institution must set the value of M_i of an unmargined transaction as the time period from the current date until the final settlement date of the underlying contract if–

(a) the contract has another derivative contract as its underlying[38]; and

(b) such unmargined transaction may be physically exercised into the underlying derivative contract (i.e. the financial institution would assume a position in the underlying contract upon exercise).

35 Such as amortising and accreting swaps.

36 For the avoidance of doubt, the treatment shall not apply to a transaction where the trade notional amount varies due to price changes (e.g. a derivative contract that falls within the foreign exchange derivatives, equity derivatives or commodity derivatives asset class).

37 The parameter scales down the adjusted notional of an unmargined transaction.

38 For example, a swaption.

S 18.12 A financial institution must set the value of M_i of an unmargined transaction as the time period from the current date until the next reset date if–

(a) the contract is structured such that any outstanding exposure is settled on specified payment dates; and

(b) the terms are reset such that the mark-to-market value of the contract is zero on those specified dates.

S 18.13 A financial institution shall calculate the maturity factor for a margined transaction using the following formula:

$$MF_i^{(margined)} = \frac{3}{2}\sqrt{\frac{MPOR_i}{1\ year}}$$

Where–

(a) $MF_i^{(margined)}$ is the maturity factor for the contract; and

(b) $MPOR_i$ is the margin period of risk appropriate for the margin agreement covering the contract, based on the requirements set out in paragraphs 18.14 to 18.19 of this Policy Document.

S 18.14 If the contract is subject to a daily margin agreement, a financial institution must observe the supervisory floor for the margin period of risk as follows:

(a) 20 business days, if the contract is under a netting set that contains more than 5,000 transactions at any point during a calendar quarter;

(b) 20 business days, if the contract is under a netting set that contains one or more trades involving either an illiquid collateral or OTC derivative transaction that cannot be easily replaced[39];

(c) the applicable floor, if the contract is subjected to the CAF CCP PD[40]; or

(d) 10 business days, under any other case.

G 18.15 During the initial rollout of a new benchmark rate, a financial institution may disregard the floor in paragraph 18.14(b) of this Policy Document for a period of up to one year after the discontinuation of an old benchmark rate. In this regard, any transitional illiquidity of the collateral and OTC derivatives transactions that reference the relevant new benchmark rate would not trigger the extended margin period of risk.

S 18.16 If the contract is subject to re-margining that is less frequent than daily, a financial institution must set the margin period of risk no less than the following:

[39] The determination of illiquid collateral and OTC derivatives transactions that cannot be easily replaced must be undertaken in the context of stressed market conditions. These are characterised by the absence of continuously active markets where a counterparty would, within two or fewer days, obtain multiple price quotations that would not move the market or represent a price reflecting a market discount (in the case of collateral) or premium (in the case of OTC derivative transaction).

[40] This includes, but not limited to, the MPOR floor of 5 days for trade exposures to clients where the financial institution is a clearing member.

$$MPOR = Floor + N - 1$$

Where–

(a) Floor is the supervisory floor as stipulated in paragraph 18.14 of this Policy Document; and

(b) N is the actual number of business days between re-margining.

S 18.17 Notwithstanding paragraphs 18.13 to 18.16 of this Policy Document, a financial institution must use the margin period of risk which is at least double the supervisory floor set out in paragraph 18.14 of this Policy Document for the current calendar quarter (and the next calendar quarter) if–

(a) the financial institution experiences more than two variation margin call disputes on the netting set consisting of the contract over the previous two calendar quarters; and

(b) the disputes have lasted longer than the applicable margin period of risk as derived in paragraphs 18.13 to 18.16 of this Policy Document.

S 18.18 In calculating the maturity factor for a contract, a financial institution shall use standard market convention to convert business days into years, and vice versa.

G 18.19 Examples of transactions, including each transaction's related residual maturity (M_i), are provided in Appendix 3. Note that margining or daily settlement have no influence on the time-period parameters. Additionally, a financial institution is expected to be guided by the following on the conversion of business days into years (and vice versa):

(a) when calculating the maturity period for an unmargined transaction, the remaining maturity (M_i) is expressed in years but subject to a floor of 10 business days. If the prevailing market practice is one year equals 250 business days, the floor is set at 10/250 years; and

(b) in calculating the maturity period for a margined transaction, the MPOR is often expressed in business days but the formula references 1 year in the denominator. If the market convention is such that one year equals 250 business days, then the denominator is expected to be converted accordingly.

Supervisory delta adjustment

S 18.20 A financial institution shall assign the following value to the supervisory delta adjustment parameter (δ) when calculating the effective notional of a derivative contract that is neither an option nor a tranched credit protection:

(a) +1 for a derivative contract that is a long position in the primary risk factor, whereby the contract's mark-to-market value increases when the value of the primary risk factor increases; or

(b) -1 for a derivative contract that is a short position in the primary risk factor, whereby the contract's mark-to-market value decreases when the value of the primary risk factor increases.

S 18.21 In the case of an option[41], a financial institution shall determine the parameter δ as follows:

Type of option	Value of δ
(a) Bought call option	$+\Phi(X)$
(b) Sold call option	$-\Phi(X)$
(c) Bought put option	$-\Phi(-X)$
(d) Sold put option	$+\Phi(-X)$
Where– (i) $\Phi(Z)$ is the cumulative distribution function of the standard normal distribution, meaning the probability that a normal random variable (with mean zero and variance of one) is less than or equal to the value Z; and (ii) X is the value to be calculated in accordance with paragraph 18.22 of this Policy Document.	

S 18.22 A financial institution must calculate X based on the formula below-

$$X = \frac{\ln\left(\frac{P_i + \lambda_i}{K_i + \lambda_i}\right) + 0.5 \times \sigma_i^2 \times T_i}{\sigma_i \times \sqrt{T_i}}$$

Where–

(a) P_i is the price of the underlying instrument which must be set–
  (i) equal to the current value of the average price, for an Asian option; or
  (ii) at either the spot price or the forward price of the underlying instrument, for any other option;

(b) K_i is the strike price of the option;

(c) λ_i is zero or, in the case of the option being classified into the interest/profit rate derivatives asset class, the lowest possible extent to which the interest/profit rates in the respective currency can become negative[42];

(d) σ_i is the supervisory volatility of the option set out in the table below; and

[41] Including European, Asian, American and Bermudan put and call options.

[42] The same value of λ must be used consistently for all interest/profit rate options in the same currency. Where appropriate, the financial institution must also consider the value of λ recommended by the relevant regulatory authority for that jurisdiction's local currency. In this regard, λ must be set to zero for Ringgit interest/profit rate options, unless communicated otherwise by the Bank.

Asset class	Subclass	σ_i
Interest/profit rate derivatives	-	50%
Foreign exchange derivatives	-	15%
Credit derivatives	Single name	100%
	Index	80%
Equity derivatives	Single name	120%
	Index	75%
Commodity derivatives	Electricity	150%
	Other commodity types	70%

(e) T_i is the time period from the current date until the latest contractual exercise date as referenced by the contract (or the latest allowed exercise date[43]), expressed in years.

G 18.23 With respect to paragraph 18.22(a)(ii) of this Policy Document, a financial institution is expected to use the forward price of the underlying instrument wherever appropriate to account for the risk-free rate and the possible cash flows prior to the option expiry such as dividends.

S 18.24 In the case of a tranched credit protection, a financial institution shall use the formula below to calculate the value of δ:

Type of tranched credit protection	Value of δ
(a) Purchased tranched credit protection	$+\frac{15}{(1+14\times A_i)\times(1+14\times D_i)}$
(b) Sold tranched credit protection	$-\frac{15}{(1+14\times A_i)\times(1+14\times D_i)}$
Where– (i) A_i is the attachment point of the tranched credit protection; and (ii) D_i is the detachment point of the tranched credit protection.	

S 18.25 For the purposes of paragraphs 18.20 and 18.24 of this Policy Document, a financial institution must treat a first-to-default, second-to-default or subsequent-to-default contract as a tranched credit protection consisting of an "n"th-to-default transaction on a pool of "m" reference names such that–

(a) the attachment point is equal to "n – 1" divided by "m"; and

(b) the detachment point is equal to "n" divided by "m".

[43] In the case of American and Bermudan options.

Effective notional for options

S 18.26 Consistent with paragraph 9.9 of this Policy Document, a financial institution shall have regard to the following when calculating the effective notional of an option:

(a) in the case of a single-payment option where the contract's payoff can be represented as a payoff consisting of a combination of European call or put options[44], the financial institution must treat each European option component as a separate transaction; and

(b) in the case of a multiple-payment option, the financial institution must treat the option as a combination of single-payment options as follows:

(i) where there is an interest/profit rate cap (or floor), the trade must be represented as a portfolio of individual caplet (or floorlet) where each caplet (or floorlet) is a European option on the floating interest/profit rate over a specific coupon period; and

(ii) for each caplet (or floorlet), the parameters S_i and T_i are the time periods from the current date to the start of the coupon period, whereas the parameter E_i is the time period from the current date until the end of the coupon period.

S 18.27 As an exception to paragraph 18.26 of this Policy Document, a financial institution must approximate the effective notional of a bought or sold digital option by observing the following steps, with K_i being the strike price of the option:

(a) the effective notional is first calculated by treating the trade as a "collar" combination of a bought and sold European option of the same type (call or put), with the strike prices set equal to 0.95 of K_i and 1.05 of K_i;

(b) the collar combined payoff is then applied to reproduce the digital option payoff such that the payoff is exactly outside the region between the two strike prices;

(c) the number of repetitions needed to reproduce the digital option payoff is used to scale up the absolute value of the effective notional for the bought and sold European component. Each component needs to be calculated separately, where T_i must be set as the time period from the current date until the exercise date of the digital option, and P_i must be set as the current price of the underlying exposure of the digital option; and

(d) the absolute value of the digital option's effective notional needs to be capped by the ratio of the digital option's payoff to the relevant supervisory factor.

S 18.28 For foreign exchange options where the calculation of the supervisory delta for foreign exchange options depends on the convention taken with respect to the ordering of the respective currency pair, a financial institution shall use the same ordering convention consistently across the financial institution and over time.

[44] For example, a collar, butterfly/calendar spread, straddle or strangle.

19. Allocation of derivative contracts into hedging sets

S 19.1 A financial institution shall further allocate derivative contracts in a netting set which are designated to the interest/profit rate derivatives asset class into the following hedging sets:

(a) contracts which are not volatility transactions and reference the interest/profit rates of the same currency must be grouped to form a hedging set;

(b) basis transactions which reference the same pair of risk factors must be grouped to form a hedging set;

(c) volatility transactions which reference interest/profit rates of the same currency must be grouped to form a hedging set; and

(d) inflation derivatives for the same currency must be grouped together to form a hedging set.

S 19.2 A financial institution shall further classify derivative contracts in a netting set which are designated to the foreign exchange derivatives asset class into the following hedging sets:

(a) derivative contracts which are not volatility transactions and reference the same currency pair must be grouped to form a hedging set[45]; and

(b) volatility transactions which reference the same currency pair must be grouped to form a hedging set.

S 19.3 A financial institution shall further assign derivative contracts in a netting set which are designated to the credit derivatives asset class into the following hedging sets:

(a) basis transactions which reference the same pair of risk factors must be grouped to form a hedging set;

(b) volatility transactions must be grouped together to form a hedging set; and

(c) all other derivative contracts must be grouped together to form a hedging set.

S 19.4 A financial institution shall further allocate derivative contracts in a netting set which are designated to the equity derivatives asset class into the following hedging sets:

(a) basis transactions which reference the same pair of risk factors must be grouped to form a hedging set;

(b) volatility transactions must be grouped together to form a hedging set; and

(c) all other derivative contracts must be grouped together to form a hedging set.

S 19.5 A financial institution shall further assign derivative contracts in a netting set which are designated to the commodity derivatives asset class into the following hedging sets:

[45] This includes derivative contracts with two floating legs that are denominated in differentiated currencies such as cross-currency swaps, as these shall not be regarded as basis transactions.

(a) basis transactions which reference the same pair of risk factors must be grouped to form a hedging set;
(b) volatility transactions must be grouped into one of the following hedging sets based on the underlying commodities of the transactions:
  (i) Energy;
  (ii) Metals;
  (iii) Agricultural; and
  (iv) Other commodities; and
(c) all other derivative contracts must be grouped into one of the following hedging sets based on the underlying commodities of the contracts:
  (i) Energy;
  (ii) Metals;
  (iii) Agricultural; and
  (iv) Other commodities.

20. Add-on for interest/profit rate derivatives asset class

S 20.1 A financial institution shall calculate the interest/profit rate derivatives asset class add-on within a netting set by aggregating the hedging set add-ons as follows:

$$\text{AddOn}^{\text{IR}} = \sum_{\text{HS-IR}} \text{AddOn}^{\text{IR}}_{\text{HS-IR}}$$

Where–
(a) AddOn^{IR} is the interest/profit rate derivatives asset class add-on;
(b) HS-IR refers to a given hedging set pursuant to paragraph 19.1 of this Policy Document; and
(c) $\text{AddOn}^{\text{IR}}_{\text{HS-IR}}$ is the add-on of a hedging set as stipulated in paragraph 20.2 of this Policy Document.

S 20.2 A financial institution shall derive the interest/profit rate derivatives asset class add-on for each hedging set by using the following formula:

$$\text{AddOn}^{\text{IR}}_{\text{HS-IR}} = \text{SF}^{\text{IR}}_{\text{HS-IR}} \times \varepsilon_{\text{HS-IR}} \times \text{Effective Notional}^{\text{IR}}_{\text{HS-IR}}$$

Where–
(a) $\text{SF}^{\text{IR}}_{\text{HS-IR}}$ is the supervisory factor of the hedging set, which is set at 0.5%;
(b) $\varepsilon_{\text{HS-IR}}$ is the supervisory factor adjustment such that–
  (i) $\varepsilon_{\text{HS-IR}} = 0.5$ for a hedging set consisting of basis transactions pursuant to paragraph 19.1(b) of this Policy Document;
  (ii) $\varepsilon_{\text{HS-IR}} = 5$ for a hedging set consisting of volatility transactions pursuant to paragraph 19.1(c) of this Policy Document; and
  (iii) $\varepsilon_{\text{HS-IR}} = 1$ for any other hedging set(s); and

(c) Effective Notional$^{IR}_{HS\text{-}IR}$ is the effective notional amount of the hedging set as set out in paragraphs 20.4 and 20.5 of this Policy Document.

G 20.3 The calculation of the add-on for the interest/profit rate derivatives asset class captures the risk of interest/profit rate derivatives of different maturities being imperfectly correlated. This is done by allocating the trades into three maturity buckets in which full offsetting of long and short positions is permitted, and by using an aggregation formula at the hedging set level that only permits limited offsetting between the maturity buckets. The allocation of derivatives to maturity buckets is only used in the interest/profit rate derivatives asset class.

S 20.4 In obtaining the effective notional amount of a hedging set, a financial institution shall calculate the effective notional of the three maturity buckets by allocating the effective notional of each derivative contract (as set out in paragraph 18 of this Policy Document) into the following maturity buckets and adding all the trade-level effective notionals within the bucket:

Maturity bucket (MB)	End date (E_i) of the contract[46]
MB1	E_i < 1 year
MB2	1 year < E_i ≤ 5 years
MB3	E_i > 5 years

S 20.5 A financial institution shall then use either of the following formula to determine the effective notional amount for hedging set:

Formula 1: Offset formula	Formula 2: No offset formula
$\text{Effective Notional}^{IR}_{HS\text{-}IR} = \sqrt{(D^{MB1})^2 + (D^{MB2})^2 + (D^{MB3})^2 + A}$	$\text{Effective Notional}^{IR}_{HS\text{-}IR} = \text{Abs}(D^{MB1}) + \text{Abs}(D^{MB2}) + \text{Abs}(D^{MB3})$
Where– (i) D^{MB1}, D^{MB2} and D^{MB3} are the effective notional amount of the maturity buckets MB1, MB2 and MB3 respectively; (ii) $A = (1.4 \times D^{MB1} \times D^{MB2}) + (1.4 \times D^{MB2} \times D^{MB3}) + (0.6 \times D^{MB1} \times D^{MB3})$; and (iii) Abs (…) is the absolute value of the term within the brackets.	

G 20.6 Appendix 4 illustrates the step-by-step approach to calculate the add-on for the interest/profit rate derivatives asset class as well as to aggregate the add-on with other asset classes.

[46] As determined in accordance with paragraph 18.4(c) of this Policy Document.

21. Add-on for foreign exchange derivatives asset class

S 21.1 A financial institution shall calculate the foreign exchange derivatives asset class add-on within a netting set by aggregating the hedging set add-ons as follows:

$$\text{AddOn}^{\text{FX}} = \sum_{\text{HS-FX}} \text{AddOn}^{\text{FX}}_{\text{HS-FX}}$$

Where–

(a) AddOn^{FX} is the foreign exchange derivatives asset class add-on;

(b) HS-FX refers to a given hedging set pursuant to paragraph 19.2 of this Policy Document; and

(c) $\text{AddOn}^{\text{FX}}_{\text{HS-FX}}$ is the add-on of a hedging set as stipulated in paragraph 21.2 of this Policy Document.

S 21.2 A financial institution shall derive the foreign exchange derivatives asset class add-on for each hedging set by using the formula below:

$$\text{AddOn}^{\text{FX}}_{\text{HS-FX}} = \text{SF}^{\text{FX}}_{\text{HS-FX}} \times \varepsilon_{\text{HS-FX}} \times \text{Abs}\left(\text{Effective Notional}^{\text{FX}}_{\text{HS-FX}}\right)$$

Where–

(a) $\text{SF}^{\text{FX}}_{\text{HS-FX}}$ is the supervisory factor of the hedging set, which is set at 4%;

(b) $\varepsilon_{\text{HS-FX}}$ is the supervisory factor adjustment such that–

(i) $\varepsilon_{\text{HS-FX}} = 5$ for a hedging set consisting of volatility transactions pursuant to paragraph 19.2(b) of this Policy Document; and

(ii) $\varepsilon_{\text{HS-FX}} = 1$ for any other hedging set(s);

(c) Abs (…) is the absolute value of the term within the brackets; and

(d) $\text{Effective Notional}^{\text{FX}}_{\text{HS-FX}}$ is the effective notional amount of the hedging set, which is calculated by adding together the trade-level effective notional of all derivative contracts (as calculated in accordance with paragraph 18 of this Policy Document) within the hedging set.

G 21.3 The calculation of the add-on for the foreign exchange derivatives asset class recognises full offsetting of long and short positions that are within the hedging set.

22. Add-on for credit derivatives asset class

S 22.1 A financial institution shall calculate the credit derivatives asset class add-on within a netting set by aggregating the hedging set add-ons as follows:

$$\text{AddOn}^{\text{Credit}} = \sum_{\text{HS-CR}} \text{AddOn}^{\text{Credit}}_{\text{HS-CR}}$$

Where–

(a) $\text{AddOn}^{\text{Credit}}$ is the credit derivatives asset class add-on;

(b) HS-CR refers to a given hedging set pursuant to paragraph 19.3 of this Policy Document; and

(c) $\text{AddOn}^{\text{Credit}}_{\text{HS-CR}}$ is the add-on of a hedging set as stipulated in paragraphs 22.2 and 22.4 of this Policy Document.

S 22.2 In calculating the hedging set add-on for the credit derivatives asset class, a financial institution shall–

(a) identify the reference entity for each derivative contract in the hedging set, whereby each credit index must be regarded as a separate entity; and

(b) calculate the combined effective notional for all contracts (as calculated in accordance with paragraph 18 of this Policy Document) which reference the same entity.

G 22.3 The calculation of the add-on for the credit derivatives asset class at the hedging set level allows for–

(a) partial offsetting between derivative contracts which reference different entities; and

(b) full offsetting for derivative contracts referencing the same entity (e.g. same corporate issuer of bonds).

S 22.4 A financial institution shall derive the credit derivatives asset class add-on for each hedging set by using the following formula:

$$\text{AddOn}^{\text{Credit}}_{\text{HS-CR}} = \varepsilon_{\text{HS-CR}} \times \sqrt{\left(\sum_{\text{RE-CR}} \rho_{\text{RE-CR}} \times \text{AddOn}^{\text{Credit}}_{\text{RE-CR}}\right)^2 + \sum_{\text{RE-CR}} \left(1 - \left(\rho_{\text{RE-CR}}\right)^2\right) \times \left(\text{AddOn}^{\text{Credit}}_{\text{RE-CR}}\right)^2}$$

Where–

(a) $\varepsilon_{\text{HS-CR}}$ is the supervisory factor adjustment such that–

(i) $\varepsilon_{\text{HS-CR}} = 0.5$ for a hedging set consisting of basis transactions pursuant to paragraph 19.3(a) of this Policy Document;

(ii) $\varepsilon_{\text{HS-CR}} = 5$ for a hedging set consisting of volatility transactions pursuant to paragraph 19.3(b) of this Policy Document; and

(iii) $\varepsilon_{HS\text{-}CR} = 1$ for any other hedging set(s);

(b) RE-CR refers to the reference entities as identified in paragraph 22.2(a) of this Policy Document;

(c) $\rho_{RE\text{-}CR}$ is the correlation factor applicable to a reference entity, which is set at 50% for single-name and 80% for index; and

(d) $AddOn^{Credit}_{RE\text{-}CR}$ is the add-on of a reference entity, as set out in paragraph 22.6 of this Policy Document.

G 22.5 The formula specified in paragraph 22.4 of this Policy Document is a single-factor model which divides the risk of the credit derivative asset class into a systematic component (the first summation term) and an idiosyncratic component (the second summation term) where–

(a) the first summation term incorporates the partial offsetting, as the entity-level add-ons for all derivative contracts are equally able to offset each other even if the reference entities are from different industries (or regions, in the case of global conglomerates);

(b) the second summation term reflects the treatment that full recognition to offset long and short positions is only allowed for those referencing the same reference entity;

(c) both terms are weighted by a correlation factor which determines the importance of the systematic component; and

(d) all else held equal, a higher correlation factor would enable a financial institution to lower its capital charge if its portfolio of derivative contracts has a relatively matched net credit position. This is because the higher factor would further allow the long and short positions to offset each other, eventhough these positions are not from the same reference entity[47].

S 22.6 A financial institution shall compute the credit derivatives asset class add-on for each reference entity as the product of the following parameters:

$$SF^{Credit}_{RE\text{-}CR} \times \text{Effective Notional}^{Credit}_{RE\text{-}CR}$$

Where–

(a) $SF^{Credit}_{RE\text{-}CR}$ is the supervisory factor applicable to the reference entity, as set out in paragraph 22.7 or 22.8 of this Policy Document whichever is appropriate; and

(b) $\text{Effective Notional}^{Credit}_{RE\text{-}CR}$ is the combined effective notional for the entity, as set out in paragraph 22.2(b) of this Policy Document.

S 22.7 In the case of a single-name reference entity, a financial institution shall map $SF^{Credit}_{RE\text{-}CR}$ to one of the supervisory factors in the table below, based on the ratings from the External Credit Assessment Institutions (ECAIs)[48] and having regard to the following:

[47] In contrast, a higher correlation factor will result in a higher capital charge if the portfolios consist of exclusively long positions (or short positions).

[48] For the avoidance of doubt, the ECAIs must be among those which the Bank has determined as meeting the eligibility criteria stipulated in Appendix 2 of the SACR PD.

(a) while the factors are based on general rating notations, the financial institution shall apply the fully mapped rating notations from the ECAIs provided in Appendix 1 of the SACR PD; and

(b) the financial institution shall also observe other requirements regarding the use of external ratings as set out in the SACR PD[49], except paragraph 11 of the SACR PD (i.e. those relating to the use of short-term ratings).

ECAI rating	Supervisory factor
AAA	0.38%
AA	0.38%
A	0.42%
BBB	0.54%
BB	1.06%
B	1.6%
CCC and below	6.0%

S 22.8 In the case of an index reference entity, a financial institution shall map $SF_{RE\text{-}CR}^{Credit}$ to either the investment grade supervisory factor (0.38%) or the non-investment grade supervisory factor (1.06%) where the financial institution must–

(a) apply the requirements in paragraphs 22.7(a) and 22.7(b) of this Policy Document; and

(b) use the investment grade supervisory factor only if the minimum credit rating specified by the index service provider is mapped to the rating category of BBB and above.

Question 8: Supervisory factor for credit derivatives

The Bank has assessed the BCBS treatment on the determination of the supervisory factor for a credit derivative contract with an index reference entity, and concluded that there is room to provide a clearer treatment in this Policy Document.

In view of this, the Bank proposes that the supervisory factor for such derivative contracts must be determined according to the minimum credit rating specified by the index service provider. If the index service provider does not specify the credit rating, then financial institutions shall apply the non-investment grade supervisory factor.

Please share whether your financial institution would face any issues together with the relevant examples to apply the treatment as set out in paragraph 22.8.

[49] This includes, but not limited to, the use of issue-specific or issuer rating.

23. Add-on for equity derivatives asset class

S 23.1 A financial institution shall calculate the equity derivatives asset class add-on within a netting set by aggregating the hedging set add-ons as follows:

$$\text{AddOn}^{\text{Equity}} = \sum_{\text{HS-EQ}} \text{AddOn}^{\text{Equity}}_{\text{HS-EQ}}$$

Where–

(a) $\text{AddOn}^{\text{Equity}}$ is the equity derivatives asset class add-on;

(b) HS-EQ refers to a given hedging set pursuant to paragraph 19.4 of this Policy Document; and

(c) $\text{AddOn}^{\text{Equity}}_{\text{HS-EQ}}$ is the add-on of a hedging set as stipulated in paragraphs 23.2 and 23.4 of this Policy Document.

S 23.2 In calculating the hedging set add-on for the equity derivatives asset class, a financial institution shall–

(a) identify the reference entity for each derivative contract in the hedging set, whereby each equity index must be regarded as a separate entity; and

(b) calculate the combined effective notional for all contracts (as calculated in accordance with paragraph 18 of this Policy Document) which reference the same entity.

G 23.3 Similar to that for credit derivatives, the calculation of the add-on for the equity derivatives asset class at the hedging set level allows for–

(a) partial offsetting between derivative contracts which reference different entities; and

(b) full offsetting for derivative contracts referencing the same entity (e.g. same corporate issuer of shares).

S 23.4 A financial institution shall derive the equity derivatives asset class add-on for each hedging set by using the following formula:

$$\text{AddOn}^{\text{Equity}}_{\text{HS-EQ}} = \varepsilon_{\text{HS-EQ}} \times \sqrt{\left(\sum_{\text{RE-EQ}} \rho_{\text{RE-EQ}} \times \text{AddOn}^{\text{Equity}}_{\text{RE-EQ}}\right)^2 + \sum_{\text{RE-EQ}} \left(1 - \left(\rho_{\text{RE-EQ}}\right)^2\right) \times \left(\text{AddOn}^{\text{Equity}}_{\text{RE-EQ}}\right)^2}$$

Where–

(a) $\varepsilon_{\text{HS-EQ}}$ is the supervisory factor adjustment such that;

(i) $\varepsilon_{\text{HS-EQ}} = 0.5$ for a hedging set consisting of basis transactions pursuant to paragraph 19.4(a) of this Policy Document;

(ii) $\varepsilon_{\text{HS-EQ}} = 5$ for a hedging set consisting of volatility transactions pursuant to paragraph 19.4(b) of this Policy Document; and

(iii) $\varepsilon_{HS\text{-}EQ} = 1$ for any other hedging set(s);

(b) RE-EQ refers to the reference entities as identified in paragraph 23.2(a) of this Policy Document;

(c) $\rho_{RE\text{-}EQ}$ is the correlation factor applicable to a reference entity, which is set at 50% for single-name and 80% for index; and

(d) $\text{AddOn}_{RE\text{-}EQ}^{Equity}$ is the add-on of a reference entity, as set out in paragraph 23.5 of this Policy Document.

S 23.5 A financial institution shall compute the equity derivatives asset class add-on for each reference entity as the product of the following parameters:

$$SF_{RE\text{-}EQ}^{Equity} \times \text{Effective Notional}_{RE\text{-}EQ}^{Equity}$$

Where–

(a) $SF_{RE\text{-}EQ}^{Equity}$ is the supervisory factor applicable to the reference entity, which is set at 32% for single name and 20% for index; and

(b) $\text{Effective Notional}_{RE\text{-}EQ}^{Equity}$ is the combined effective notional for the entity, as set out in paragraph 23.2(b) of this Policy Document.

G 23.6 The supervisory factors for the equity derivatives asset class were calibrated based on estimates of the market volatility of equity indices, with the application of a conservative beta factor[50] to translate this estimate into an estimate of the individual volatilities.

S 23.7 In ensuring a consistent implementation of the requirements while keeping the treatment simple and prudent, a financial institution shall not include any modelling assumptions in the calculation of the add-ons. Specifically in the case of calculating the equity derivatives asset class add-on, these assumptions include, but are not limited to, the financial institution's own estimates of individual volatilities or taking publicly available estimates of beta. The financial institution must only use the supervisory factors defined in paragraph 23.5(a) of this Policy Document.

[50] The beta of an individual equity measures the volatility of the stock relative to a broad market index. A value of beta greater than one means the individual equity is more volatile than the index. The greater the beta is, the more volatile the stock. The beta is calculated by running a linear regression of the stock on the broad index.

24. Add-on for commodity derivatives asset class

S 24.1 A financial institution shall calculate the commodity derivatives asset class add-on within a netting set by aggregating the netting set add-ons as follows:

$$\text{AddOn}^{\text{Commodity}} = \sum_{\text{HS-CO}} \text{AddOn}_{\text{HS-CO}}^{\text{Commodity}}$$

Where–

(a) $\text{AddOn}^{\text{Commodity}}$ is the commodity derivatives asset class add-on;

(b) HS-CO refers to a given hedging set pursuant to paragraph 19.5 of this Policy Document; and

(c) $\text{AddOn}_{\text{HS-CO}}^{\text{Commodity}}$ is the add-on of a hedging set as stipulated in paragraph 24.7 of this Policy Document.

S 24.2 In calculating the hedging set add-on for the commodity derivatives asset class, a financial institution shall–

(a) establish the relevant commodity types of the hedging set[51], whereby this must be supported by an assessment to demonstrate that–

(i) the proposed commodity types have a stable and meaningful joint dynamics; and

(ii) the financial institution is not significantly exposed to the basis risk of different products within a given commodity type;

(b) identify the commodity type for each derivative contract in the hedging set; and

(c) calculate the combined effective notional for all contracts (as calculated in accordance with paragraph 18 of this Policy Document) which reference the same commodity type.

S 24.3 With respect to paragraph 24.2, a financial institution which has assigned at least one derivative contract into the energy hedging set pursuant to either paragraph 19.5(b) or paragraph 19.5(c) of this Policy Document shall establish electricity as one of the commodity types within the hedging set.

G 24.4 The calculation of the add-on for the commodity derivatives asset class at the hedging set level allows for–

(a) partial offsetting between derivative contracts which reference different commodity types within a given hedging set[52]; and

(b) full offsetting for derivative contracts referencing the same commodity type.

[51] For example, copper is within the “metals” hedging set. Another example is that the “energy” hedging set contains commodity types such as crude oil, electricity, natural gas and coal.

[52] Offsetting between hedging sets is not recognised (e.g. a forward contract on crude oil cannot hedge a forward contract on corn).

G 24.5 Subject to paragraph 24.6 of this Policy Document, a financial institution is not expected to specify the commodity types to account for all basis risk[53].

S 24.6 If the Bank deems that a financial institution is significantly exposed to the basis risk of different products within those commodity types, the financial institution shall develop and implement more refined definitions of commodity types than those initially established under paragraph 24.2(a) of this Policy Document.

S 24.7 A financial institution shall calculate the commodity derivatives asset class add-on for each hedging set by using the following formula:

$$\text{AddOn}_{\text{HS-CO}}^{\text{Commodity}} = \varepsilon_{\text{HS-CO}} \times \sqrt{\left(\sum_{\text{CoType}} \rho_{\text{CoType}} \times \text{AddOn}_{\text{CoType}}\right)^2 + \sum_{\text{CoType}} \left(1 - \left(\rho_{\text{CoType}}\right)^2\right) \times \left(\text{AddOn}_{\text{CoType}}\right)^2}$$

Where–

(a) $\varepsilon_{\text{HS-CO}}$ is the supervisory factor adjustment such that–
  (i) $\varepsilon_{\text{HS-CO}} = 0.5$ for a hedging set consisting of basis transactions pursuant to paragraph 19.5(a) of this Policy Document;
  (ii) $\varepsilon_{\text{HS-CO}} = 5$ for a hedging set consisting of volatility transactions pursuant to paragraph 19.5(b) of this Policy Document; and
  (iii) $\varepsilon_{\text{HS-CO}} = 1$ for any other hedging set(s);

(b) CoType refers to a commodity type established pursuant to paragraph 24.2(a) of this Policy Document;

(c) ρ_{CoType} is the correlation factor applicable to a commodity type, which is set at 40%; and

(d) $\text{AddOn}_{\text{CoType}}$ is the add-on of a commodity type, as set out in paragraph 24.8 of this Policy Document.

S 24.8 A financial institution shall compute the commodity derivatives asset class add-on for each commodity type as the product of the following parameters:

$$\text{SF}_{\text{CoType}} \times \text{Effective Notional}_{\text{CoType}}$$

Where–

(a) $\text{SF}_{\text{CoType}}$ is the supervisory factor applicable to the commodity type, which is set at 40% for the electricity commodity type and 18% for other commodity types; and

(b) $\text{Effective Notional}_{\text{CoType}}$ is the combined effective notional for the commodity type, as set out in paragraph 24.2(c) of this Policy Document.

[53] For example, defining crude oil as a commodity type could omit a substantial basis risk between the different types of crude oil (e.g. West Texas Intermediate, Brent, Saudi Light).

PART F APPLICATION GUIDANCE

25. Additional guidance on SA-CCR

G 25.1 Appendix 5 includes a summary of the supervisory factors, correlations and supervisory option volatility add-ons for each asset class and subclass.

G 25.2 Seven examples are included under Appendix 6 on the calculation of exposure value under SA-CCR. While the values for intermediate steps are not rounded in the actual calculations, these values as well as the final values presented in the examples have been rounded.

APPENDICES

APPENDIX 1 CCR Concept

Counterparty credit risk explanation

1. When a financial institution grants a loan to a borrower, the credit risk exposure is unilateral. The financial institution is exposed to the risk of loss arising from the default of the borrower, but the transaction does not expose the borrower to a risk of loss from the default of the financial institution. By contrast, transactions under the scope of counterparty credit risk capital charge give rise to a bilateral risk of loss. Specific examples on these transactions are elaborated in paragraphs 2 to 5 of Appendix 1.

2. When a financial institution grants a loan to a borrower and receives collateral from the borrower[54]–
   (a) the financial institution is exposed to the risk that the borrower may default and the sale of the collateral is insufficient to cover the loss on the loan; and
   (b) the borrower is exposed to the risk that the financial institution defaults and does not return the collateral. Even in cases where the borrower has the legal right to offset the amount it owes on the loan in compensation for the lost collateral, the borrower is still exposed to the risk of loss at the outset of the loan because the value of the loan may be less than the value of the collateral the time of default of the financial institution.

3. When a financial institution borrows cash from a counterparty and posts collateral to the counterparty (or undertakes a transaction that is economically equivalent, such as a repurchase agreement transaction)−
   (a) the financial institution is exposed to the risk that its counterparty defaults and does not return the collateral that the financial institution posted; and
   (b) the counterparty is exposed to the risk that the financial institution defaults and the amount the counterparty raises from the sale of the collateral that the financial institution posted is insufficient to cover the loss on the counterparty's loan to the financial institution.

4. When a financial institution borrows a security from a counterparty and posts cash to the counterparty as collateral (or undertakes a transaction that is economically equivalent, such as a reverse repurchase agreement transaction)−
   (a) the financial institution is exposed to the risk that its counterparty defaults and does not return the cash that the financial institution posted as collateral; and
   (b) the counterparty is exposed to the risk that the financial institution defaults and the amount of cash that the financial institution posted as

[54] The bilateral risk of loss in this example arises because the bank receives (i.e. takes possession of) the collateral as part of the transaction. By contrast, collateralised loans where the collateral is not exchanged prior to default do not give rise to a bilateral risk of loss. For example, a corporate or retail loan secured on a property of the borrower where the bank may only take possession of the property when the borrower defaults does not give rise to counterparty credit risk.

collateral is insufficient to cover the loss of the security that the financial institution borrowed.

5. When a financial institution enters a derivative transaction with a counterparty (e.g. it enters a swap transaction or purchases an option), the value of the transaction can vary over time with the movement of underlying market factors[55]–
   (a) the financial institution is exposed to the risk that its counterparty defaults and does not return the cash that the financial institution posted as collateral; and
   (b) the counterparty is exposed to the risk that the financial institution defaults and the cash that the financial institution posted as collateral is insufficient to cover the loss of the security that the financial institution borrowed.

Specific risks related to counterparty credit risk

6. Financial institutions are expected to manage the specific risks related to counterparty credit risk, even though such risks are not being specifically embedded as part of the SA-CCR calculation. Further elaborations on these specific risks are provided in paragraphs 7 to 8 of Appendix 1.

7. General wrong-way risk arises when the probability of default of counterparties is positively correlated with general market risk factors.

8. Specific wrong-way risk arises when the exposure to a particular counterparty is positively correlated with the probability of default of the counterparty due to the nature of the transactions with the counterparty.

Explanation on the scope of counterparty credit risk charge

9. The transactions listed in paragraph 5.1 of this Policy Document generally exhibit the following abstract characteristics:
   (a) the transactions generate a current exposure or market value;
   (b) the transactions have an associated random future market value based on market variables;
   (c) the transactions generate an exchange of payments or an exchange of a financial instrument (including commodities) against payment; and
   (d) the transactions are undertaken with an identified counterparty against which a unique probability of default can be determined.

10. Other common characteristics of the transactions listed in paragraph 5.1 of this Policy Document include the following:

[55] The counterparty credit risk rules capture the risk of loss to the bank from the default of the derivative counterparty. On the other hand, the risk of gains or losses on the changing market value of the derivative is captured by the market risk framework which captures the risk that the bank will suffer a loss as a result of market movements in underlying risk factors referenced by the derivative (e.g. interest rates for an interest rate swap); however, it also captures the risk of losses that can result from the derivative declining in value due to a deterioration in the creditworthiness of the derivative counterparty. The latter risk is the credit valuation adjustment risk.

(a) collateral may be used to mitigate risk exposure and is inherent in the nature of some transactions;
(b) short-term financing may be a primary objective in that the transactions mostly consist of an exchange of one asset for another (cash or securities) for a relatively short period of time, usually for the business purpose of financing. The two sides of the transactions are not the result of separate decisions but form an indivisible whole to accomplish a defined objective;
(c) netting may be used to mitigate the risk;
(d) positions are frequently valued (most commonly on a daily basis), according to market variables; or
(e) remargining may be employed.

APPENDIX 2 Effect of standard margin agreements on SA-CCR RC calculation

1. Five examples are provided below to illustrate the calculation of SA-CCR in the context of standard margin agreements. In particular, the examples relate to the formulation of replacement cost for margined trades, as set out in paragraph 12.2 of this Policy Document.

Example 1

2. The financial institution currently has met all past variation margin calls so that the value of trades with its counterparty (RM80 million) is offset by cumulative variation margin in the form of cash collateral received. There is a small "minimum transfer amount" ("MTA") of RM1 million and a RM0 "margin threshold" ("TH"). Furthermore, an "independent amount" ("IA") of RM10 million is agreed in favour of the financial institution and none in favour of its counterparty (i.e. the net independent collateral amount ("NICA") is RM10 million). This leads to a credit support amount of RM90 million, which is assumed to have been fully received as of the reporting date.

3. In this example, the three terms in the replacement cost formula are as follows:
   (a) V − C = RM80 million − RM90 million = − RM10 million;
   (b) TH + MTA − NICA = RM0 + RM1 million − RM10 million = − RM9 million; and
   (c) The third term in the RC formula is always zero, which ensures that replacement cost is not negative.

4. Since the highest of the three terms (−RM10 million, −RM9 million, 0) is zero, the replacement cost is zero. This is due to the large amount of collateral posted by the financial institution's counterparty.

Example 2

5. The financial institution has met all variation margin calls, but the financial institution has some residual exposure due to the MTA of RM1 million in its master agreement, and has a RM0 TH. The value of the financial institution's trades with the counterparty is RM80 million and the financial institution holds RM79.5 million in variation margin in the form of cash collateral. In addition, the financial institution holds RM10 million in independent collateral (here being an initial margin independent of variation margin, the latter of which is driven by mark-to-market changes from the counterparty). The counterparty holds RM10 million in independent collateral from the financial institution, which is held by the counterparty in a non-segregated manner. The NICA is therefore RM0 (= RM10 million independent collateral held less RM10 million independent collateral posted).

6. In this example, the three terms in the replacement cost formula are as follows:
   (a) V − C = RM80 million − (RM79.5 million + RM10 million − RM10 million) = RM0.5 million;
   (b) TH + MTA − NICA = RM0 + RM1 million − RM0 = RM1 million; and
   (c) The third term is zero.

7. The replacement cost is the highest of the three terms (RM0.5 million, RM1 million, 0) which is RM1 million. This represents the largest exposure before collateral must be exchanged.

Standard margin agreements for CCP trades (where a financial institution is a clearing member)

8. In the case where a financial institution is a clearing member, one example in which the replacement cost formula for margined trades can be applied is when the financial institution is a clearing member and is calculating replacement cost for its own trades with a CCP. In this case, the MTA and TH are generally zero. Variation margin is usually exchanged at least daily and the independent collateral amount ("ICA") in the form of a performance bond or initial margin is held by the CCP.

Example 3

9. In the case where a financial institution is a clearing member, one example in which the replacement cost formula for margined trades can be applied is when the financial institution is a clearing member and is calculating replacement cost for its own trades with a CCP. In this case, the MTA and TH are generally zero. VM is usually exchanged at least daily and the ICA in the form of a performance bond or IM is held by the CCP.

10. Given that the initial margin is held by the CCP in a bankruptcy remote manner, paragraph 13.4 of this Policy Document permits this amount to be excluded in the calculation of NICA. Therefore, the NICA is RM0 because the bankruptcy-remote initial margin posted to the CCP can be excluded and the bank has not received any initial margin from the CCP. The value of C is calculated as the value of NICA plus any variation margin received less any variation margin posted. The value of C is thus −RM50 million (= RM0 million + RM0 million − RM50 million).

11. In this example, the three terms in the replacement cost formula are as follows:
    (a) V − C = (−RM50 million) − (−RM50 million) = RM0. That is, the negative value of the trades has been fully offset by the VM posted by the financial institution;
    (b) TH + MTA − NICA = RM0 + RM0 − RM0 = RM0; and
    (c) The third term is zero.

12. The replacement cost is therefore RM0.

Example 4

13. Example 4 has the same details as Example 3, except that the initial margin posted to the CCP is not bankruptcy-remote. As a consequence, the RM10 million of initial margin must be included in the calculation of NICA. Thus, NICA is −RM10 million (= ICA received of RM0 minus unsegregated ICA posted of RM10 million). Also, the value of C is −RM60 million (= NICA + VM received - VM posted = −RM10 million + RM0 − RM50 million).

14. In this example, the three terms in the replacement cost formula are as follows:
    (a) V − C = (−RM50 million) − (−RM60 million) = RM10 million. That is, the negative value of the trades is more than fully offset by collateral posted by the financial institution;
    (b) TH + MTA − NICA = RM0 + RM0 − (−RM10 million) = RM10 million; and
    (c) The third term is zero.

15. The replacement cost is therefore RM10 million. This represents the initial margin posted to the CCP which risks being lost upon default and bankruptcy of the CCP.

Example 5: Maintenance Margin Agreement

16. Some margin agreements specify that a counterparty (in this case, a financial institution) must maintain a level of collateral that is a fixed percentage of the mark-to-market value of the transactions in a netting set. For this type of margining agreement, ICA is the amount of collateral that the counterparty must maintain above the net mark-to-market value of the transactions.

17. For example, the agreement states that a counterparty must maintain a collateral balance of at least 140% of the mark-to-market value of its transactions and that the mark-to-market value of the derivative transactions is RM50 in the financial institution's favour. ICA in this case is RM20 (= 140% * RM50 − RM50). Furthermore, suppose that there is no TH and no MTA, the financial institution has posted no collateral, and the counterparty has posted RM80 in cash collateral. In this example, the three terms of the replacement cost formula are as follows:
    (a) V − C = RM50 − RM80 = −RM30;
    (b) MTA + TH − NICA = RM0 + RM0 − RM20 = −RM20; and
    (c) The third term is zero.

18. Thus, the replacement cost is RM0.

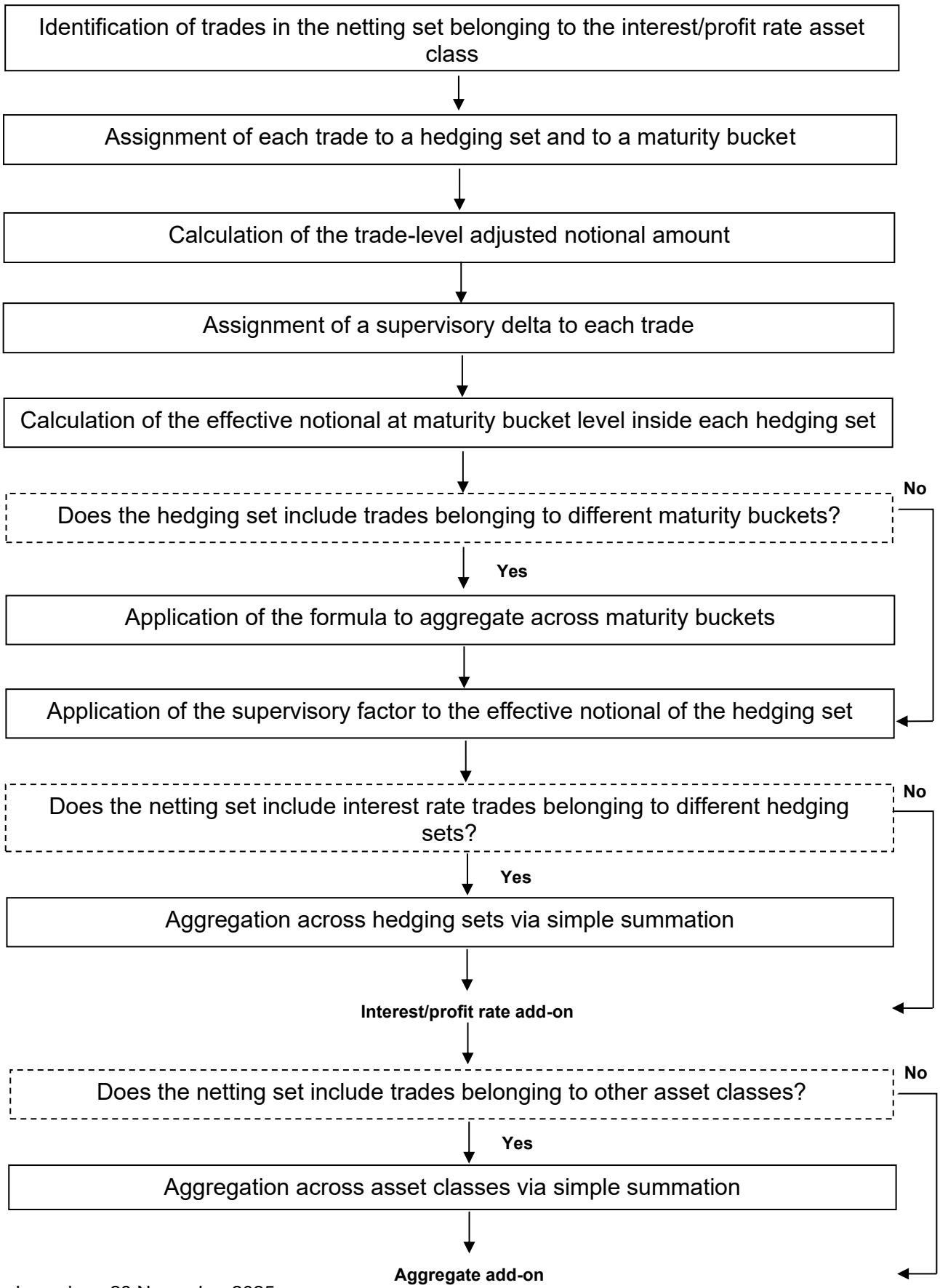
APPENDIX 3 Examples on the application of time-period parameters

Transaction	S_i	E_i	M_i
Interest rate or credit default swap maturing in 10 years	0	10 years	10 years
10-year interest rate swap, forward starting in 5 years	5 years	15 years	15 years
Forward rate agreement for time period starting in 6 months and ending in 12 months[56]	0.5 year	1 year	1 year
Cash-settled European swaption referencing 5-year interest rate swap with exercise date in 6 months	0.5 year	5.5 years	0.5 year
Physically-settled European swaption referencing 5-year interest rate swap with exercise date in 6 months	0.5 year	5.5 years	5.5 years
10-year Bermudan swaption with annual exercise dates	1 year	10 years	10 years
Interest rate cap or floor specified for semi-annual interest rate with maturity 5 years	0	5 years	5 years
Option on a bond maturing in 5 years with the latest exercise date in 1 year	1 year	5 years	1 year
3-month Eurodollar futures that matures in 1 year	1 year	1.25 years	1 year
Futures on 20-year treasury bond that matures in 2 years	2 years	22 years	2 years
6-month option on 2-year futures on 20-year treasury bond	2 years	22 years	2 years

[56] This example assumes that the payment is made at the end of the period, similar to vanilla interest rate swaps. If the payment is made at the beginning of the period, as it is typically the case according to market convention, M_i should be 0.5 years instead of 1 year.

APPENDIX 4 Steps to calculate interest/profit rate add-on

The diagram below provides a broad illustration on the necessary steps to calculate add-ons for trades in the interest/profit rate asset class.



APPENDIX 5 Supervisory specified parameters

Asset Class	Subclass	Supervisory factor	Correlation	Supervisory option volatility
Interest/profit rate	-	0.50%	N/A	50%
Foreign exchange	-	4.0%	N/A	15%
Credit, Single Name	AAA	0.38%	50%	100%
	AA	0.38%	50%	100%
	A	0.42%	50%	100%
	BBB	0.54%	50%	100%
	BB	1.06%	50%	100%
	B	1.6%	50%	100%
	CCC and below	6.0%	50%	100%
Credit, Index	BBB and above	0.38%	80%	80%
	BB and below	1.06%	80%	80%
Equity, Single Name	-	32%	50%	120%
Equity, Index	-	20%	80%	75%
Commodity	Electricity	40%	40%	150%
	Other commodity types	18%	40%	70%

APPENDIX 6 Examples of SA-CCR application to sample portfolios

1. In this Appendix, seven sub-examples are used to illustrate the operation of the SA-CCR in the context of different sample portfolios as follows:
   (a) Interest/profit rate derivatives (unmargined netting set)
   (b) Credit derivatives (unmargined netting set)
   (c) Commodity derivatives (unmargined netting set)
   (d) Interest/profit rate and credit derivatives (unmargined netting set)
   (e) Interest/profit rate and commodities derivatives (margined netting set)
   (f) Derivatives with multiple risk drivers (unmargined netting set)
   (g) Equity derivatives (unmargined netting set)

2. All notional amounts, mark-to-market values and computations in these sub-examples are in thousands of USD, unless stated otherwise.

Example 1: Interest/profit rate derivatives (unmargined netting set)

3. Netting set 1 consists of three interest/profit rate derivatives: two fixed versus floating interest rate swaps and one purchased physically settled European swaption. The table below summarises the relevant contractual terms.

Trade no.	Nature	Residual maturity	Base currency	Notional	Pay Leg (*)	Receive Leg (*)	Mark-to-market value
1	Interest rate swap	10 years	USD	10,000	Fixed	Floating	30
2	Interest rate swap	4 years	USD	10,000	Floating	Fixed	−20
3	European swaption	1 into 10 years	EUR	5,000	Floating	Fixed	50
(*) For the swaption, the legs are those of the underlying swap.							

4. The netting set is not subject to a margin agreement and there is no exchange of collateral at inception (i.e. independent collateral). For unmargined netting sets, the replacement cost is calculated using the following formula as set out in paragraph 12.1 of this Policy Document:

$$RC = \max (V - C ; 0)$$

Where–
   (a) V is a simple algebraic sum of the derivatives' mark-to-market values at the reference date; and
   (b) C is the haircut value of net collateral held for the netting set, which is zero in this example.

5. Thus, using the market values indicated in the table:

$$RC = \max (30 - 20 + 50 - 0; 0) = 60$$

6. Since the netting set is under-collateralised, the value of the multiplier is 1. This is further explained in paragraph 15.3 of this Policy Document.

7. The remaining term to be calculated in the calculation of exposure value is the aggregate add-on ($AddOn^{aggregate}$). As all the transactions in the netting set belong to the interest/profit rate derivatives asset class, $AddOn^{aggregate}$ can be calculated using the steps set out in paragraph 20 of this Policy Document.

Step 1: Calculate the effective notional for each trade in the netting set

8. For each trade i, the effective notional D is calculated as follows as set out in paragraph 18.2 of this Policy Document:

$$D = d \times MF \times \delta$$

Where−

(a) d is the adjusted notional of the trade;
(b) δ is the supervisory delta adjustment of the trade; and
(c) MF is the maturity factor.

9. For interest/profit rate derivatives, the trade-level adjusted notional (d) is the product of the trade notional amount and the supervisory duration (SD_i). The supervisory duration is calculated using the following formula, where–

(a) S_i and E_i are the start and end dates, respectively, of the time period referenced by the interest/profit rate derivative (or, where such a derivative references the value of another interest/profit rate instrument, the time period determined on the basis of the underlying instrument). If the start date has occurred (e.g. an ongoing interest or profit rate swap), S_i must be set to zero; and
(b) the calculated value of SD_i is floored at 10 business days (which expressed in years, using an assumed market convention of 250 business days a year is 10/250 years).

$$SD_i = \frac{\exp(-0.05 \times S_i) - \exp(-0.05 \times E_i)}{0.05}$$

10. Using the formula for supervisory duration shown above, the trade-level adjusted notional amounts for each of the trades in Example 1 are as follows:

Trade no.	Notional	S_i	E_i	SD_i	Adjusted notional, d
1	10,000	0	10	7.87	78,694
2	10,000	0	4	3.63	36,254
3	5,000	1	11	7.49	37,428

11. Paragraph 18.10 of this Policy Document sets out the calculation of the maturity factor (MF_i) for unmargined trades. For trades that have a remaining maturity in excess of one year, which is the case for all trades in this example, the formula gives a maturity factor of 1.

12. As set out in paragraphs 18.20 to 18.25 of this Policy Document, a supervisory delta is assigned to each trade. In particular–
    (a) Trade 1 is long in the primary risk factor (the reference floating rate) and is not an option. Therefore, the supervisory delta is equal to 1;
    (b) Trade 2 is short in the primary risk factor and is not an option; thus, the supervisory delta is equal to −1; and
    (c) Trade 3 is an option to enter into an interest rate swap that is short in the primary risk factor and therefore is treated as a bought put option. As such, the supervisory delta is determined by applying the relevant formula in paragraphs 18.21 and 18.22 of this Policy Document, using 50% as the supervisory option volatility and 1 (year) as the option exercise date. Assuming the underlying price (the appropriate forward swap rate) is 6% and the strike price (the swaption's fixed rate) is 5%, the supervisory delta is:

$$\delta_i = -\Phi\left(-\frac{\ln\left(\frac{0.06}{0.05}\right)+0.5\times0.5^2\times1}{0.5\times\sqrt{1}}\right) = -0.2694$$

13. The effective notional for each trade in the netting set (D) is calculated using the formula $D = d \times MF \times \delta$ and values for each term noted above. The results of applying the formula are as follows:

Trade no.	Notional	Adjusted notional, d	Maturity factor, MF	Delta, δ	Effective notional, D
1	10,000	78,694	1	1	78,694
2	10,000	36,254	1	−1	−36,254
3	5,000	37,428	1	−0.2694	−10,083

Step 2: Allocate the trades to hedging sets

14. In the interest/profit rate derivatives asset class, the hedging sets consist of all the derivatives that reference the same currency. In this example, the netting set is comprised of two hedging sets, since the trades refer to interest/profit rates denominated in two different currencies (USD and EUR).

Step 3: Within each hedging set allocate each of the trades to the maturity buckets

15. For this example, within the hedging set "USD", trade 1 falls into the third maturity bucket (more than 5 years) and trade 2 falls into the second maturity bucket (between one and five years). Trade 3 falls into the third maturity bucket (more than 5 years) of the hedging set "EUR". The results of steps 1 to 3 are summarised in the table below:

Trade no.	Effective notional, D	Hedging set	Maturity bucket
1	78,694	USD	3
2	−36,254	USD	2
3	−10,083	EUR	3

Step 4: Calculate the effective notional of each maturity bucket within each hedging set (USD and EUR)

16. Add together all the trade-level effective notionals (D^{MB1}, D^{MB2} and D^{MB3}) within each maturity bucket in the hedging set.

17. In this example, there are no maturity buckets within a hedging set with more than one trade, and thus, the effective notional of each maturity bucket is equal to the effective notional of the single trade in each bucket. Specifically–
    (a) for the USD hedging set: D^{MB1} is zero, D^{MB2} is −36,254 and D^{MB3} is 78,694; and
    (b) for the EUR hedging set: D^{MB1} and D^{MB2} are zero and D^{MB3} is −10,083.

Step 5: Calculate the effective notional of the hedging set (Effective Notional$^{IR}_{HS\text{-}IR}$)

18. Use either of the two following aggregation formulas, where the latter is to be used if the financial institution chooses not to recognise offsets between long and short positions across maturity buckets:

Formula 1: Offset formula	Formula 2: No offset formula
$\text{Effective Notional}^{IR}_{HS\text{-}IR} = \sqrt{(D^{MB1})^2 + (D^{MB2})^2 + (D^{MB3})^2 + A}$	$\text{Effective Notional}^{IR}_{HS\text{-}IR} = \text{Abs}(D^{MB1}) + \text{Abs}(D^{MB2}) + \text{Abs}(D^{MB3})$
Where– (i) D^{MB1}, D^{MB2} and D^{MB3} are the effective notional amount of the maturity buckets MB1, MB2 and MB3 respectively; (ii) $A = (1.4 \times D^{B1} \times D^{B2}) + (1.4 \times D^{B2} \times D^{B3}) + (0.6 \times D^{B1} \times D^{B3})$; and (iii) Abs (…) is the absolute value of the term within the brackets.	

19. In this example, the first of the two aggregation formulas is used. Therefore, the effective notionals for the USD hedging set (EN_{USD}) and the EUR hedging set (EN_{EUR}) are, respectively–

$$EN_{USD} = \sqrt{(-36{,}254)^2 + (78{,}694)^2 + 1.4 \times (-36{,}254) \times 78{,}694} = 59{,}270$$

$$EN_{EUR} = \sqrt{(-10{,}083)^2} = 10{,}083$$

Step 6: Calculate the hedging set level add-on ($AddOn^{IR}_{HS\text{-}IR}$)

20. As set out in paragraph 20.2 of this Policy Document, this is computed as the product of the effective notional of the hedging set (Effective $Notional^{IR}_{HS\text{-}IR}$), the specified supervisory factor ($SF^{IR}_{HS\text{-}IR}$) and the supervisory factor adjustment ($\varepsilon_{HS\text{-}IR}$). The supervisory factor adjustment is equal to 1, since the trades are neither basis transactions nor volatility transactions.

21. The specified supervisory factor in the interest/profit rate asset class is set at 0.5%. Therefore, the add-on for USD and EUR hedging sets are, respectively–

$$AddOn_{USD} = 59{,}270 \times 0.005 = 296.35$$

$$AddOn_{EUR} = 10{,}083 \times 0.005 = 50.415$$

Step 7: Calculate the asset class level add-on ($AddOn^{IR}$)

22. Add together all the hedging set level add-ons calculated in step 6. Therefore, the add-on for the interest/profit rate asset class is–

$$AddOn^{IR} = 296.35 + 50.415 = 347$$

23. For this netting set, the interest/profit rate add-on is also the aggregate add-on because there are no derivatives belonging to other asset classes. The exposure value for the netting set can now be calculated using the formula set out in paragraph 9.3 of this Policy Document:

$$\text{Exposure value} = \text{Alpha} \times (\text{RC} + \text{multiplier} \times AddOn^{aggregate})$$
$$= 1.4 \times (60 + 1 \times 347) = 569$$

Example 2: Credit derivatives (unmargined netting set)

25. Netting set 2 consists of three credit derivatives: one long single-name credit default swap (CDS) written on Firm A (rated AA), one short single-name CDS written on Firm B (rated BBB), and one long CDS index (investment grade). The table below summarises the relevant contractual terms.

Trade no.	Nature	Reference entity name	Reference entity rating	Residual maturity	Base currency	Notional	Position	Mark-to-market value
1	Single-name CDS	Firm A	AA	3 years	USD	10,000	Protection buyer	20
2	Single-name CDS	Firm B	BBB	6 years	EUR	10,000	Protection seller	−40
3	CDS index	CDX.IG 5y	Investment grade	5 years	USD	10,000	Protection buyer	0

26. As in Example 1 of this Appendix, the netting set is not subject to a margin agreement and there is no exchange of collateral at inception (i.e. independent collateral). For unmargined netting sets, the replacement cost is calculated using the following formula:

$$RC = \max (V - C ; 0)$$

Where–

(a) V is a simple algebraic sum of the derivatives' mark-to-market values at the reference date; and

(b) C is the haircut value of net collateral held for the netting set, which is zero in this example.

27. Thus, using the market values indicated in the table:

$$RC = \max (20 - 40 + 0 - 0; 0) = 0$$

28. Since in this example, V − C is negative (equal to V, i.e. −20), the multiplier is activated as it will be less than 1. Before calculating its value, the aggregate add-on ($AddOn^{aggregate}$) needs to be determined.

29. All the transactions in the netting set belong to the credit derivatives asset class. The $AddOn^{aggregate}$ for the credit derivatives asset class can be calculated using the four steps set out in paragraph 22 of this Policy Document.

Step 1: Calculate the effective notional for each trade in the netting set

30. For each trade i, the effective notional D is calculated as follows, as set out in paragraph 18.2 of this Policy Document:

$$D = d \times MF \times \delta$$

Where−

(a) d is the adjusted notional of the trade;
(b) δ is the supervisory delta adjustment of the trade; and
(c) MF is the maturity factor.

31. For credit derivatives, like interest/profit rate derivatives, the trade-level adjusted notional (d) is the product of the trade notional amount and the supervisory duration (SD_i). The trade-level adjusted notional amounts for each of the trades in this example are as follows:

Trade no.	Notional	S_i	E_i	SD_i	Adjusted notional, d
1	10,000	0	3	2.79	27,858
2	10,000	0	6	5.18	51,836
3	10,000	0	5	4.42	44,240

32. Paragraph 18.10 of this Policy Document sets out the calculation of the maturity factor (MF_i) for unmargined trades. For trades that have a remaining maturity in excess of one year, which is the case for all trades in this example, the formula gives a maturity factor of 1.

33. As set out in paragraphs 18.20 to 18.25 of this Policy Document, a supervisory delta is assigned to each trade. In particular–

(a) Trade 1 and Trade 3 are long in the primary risk factors (CDS spread) and are not options. Thus, the supervisory delta is equal to 1 for each trade; and
(b) Trade 2 is short in the primary risk factor and is not an option. Thus, the supervisory delta is equal to −1.

34. The effective notional for each trade in the netting set (D_i) is calculated using the formula $D = d \times MF \times \delta$ and values for each term noted above. The results of applying the formula are as follows:

Trade no.	Notional	Adjusted notional, d	Maturity factor, MF	Delta, δ	Effective notional, D
1	10,000	27,858	1	1	27,858
2	10,000	51,836	1	−1	−51,836
3	10,000	44,240	1	1	44,240

Step 2: Calculate the combined effective notional for all derivatives that reference the same entity (Effective Notional$^{\text{Credit}}_{\text{RE-CR}}$)

35. This is calculated by adding together the trade-level effective notionals (D) calculated in step 1 that reference the entity. However, since all the derivatives refer to different entities (single names/indices), the effective notional of the entity is equal to the trade-level effective notional for each trade.

Step 3: Calculate the add-on for each entity (AddOn$^{\text{Credit}}_{\text{RE-CR}}$)

36. Multiply the entity-level effective notional in step 2 by the supervisory factor that is specified for that entity (SF$^{\text{Credit}}_{\text{RE-CR}}$). The supervisory factors are set out in 22.7 and 22.8 of this Policy Document. A supervisory factor is assigned to each single-name entity based on the rating of the reference entity (0.38% for AA-rated firms and 0.54% for BBB-rated firms). For CDS indices, the supervisory factor is assigned according to whether the index is investment grade (BBB and above) or non-investment grade (BB and below). In this example, its value is 0.38% since the index is investment grade.

37. Thus, the reference entity level add-ons are as follows:

Reference entity (RE)	Combined effective notional	Supervisory factor, $SF^{\text{Credit}}_{\text{RE-CR}}$	Entity-level add-on, $AddOn^{\text{Credit}}_{\text{RE-CR}}$
Firm A	27,858	0.38%	106
Firm B	−51,836	0.54%	−280
CDX.IG	44,240	0.38%	168

Step 4: Calculate the asset class level add-on (AddOn$^{\text{Credit}}$)

38. Since the trades in this netting set are neither basis transactions nor volatility transactions, there is only one hedging set in this asset class. The asset class level add-on equals to the hedging set add-on (AddOn$^{\text{Credit}}_{\text{HS-CR}}$), as follows:

$$\text{AddOn}^{\text{Credit}}_{\text{HS-CR}} = \varepsilon_{\text{HS-CR}} \times \sqrt{\underbrace{\left(\sum_{\text{RE-CR}} \rho_{\text{RE-CR}} \times \text{AddOn}^{\text{Credit}}_{\text{RE-CR}}\right)^2}_{\text{systematic component}} + \underbrace{\sum_{\text{RE-CR}} \left(1 - \left(\rho_{\text{RE-CR}}\right)^2\right) \times \left(\text{AddOn}^{\text{Credit}}_{\text{RE-CR}}\right)^2}_{\text{idiosyncratic component}}}$$

Where−

(a) HS-CR refers to a given hedging set;

(b) $\varepsilon_{\text{HS-CR}}$ is set at a value equal to 1, according to paragraph 22.4(a) of this Policy Document;

(c) the summations are across all entities referenced by the derivatives;

(d) RE-CR refers to the reference entities;

(e) $\rho_{RE\text{-}CR}$ is the supervisory prescribed correlation factor corresponding to the entity. As set out in paragraph 22.4(c) of this Policy Document, the correlation factor is 50% for single entities (Firm A and Firm B) and 80% for indexes (CDX.IG); and

(f) $AddOn_{RE\text{-}CR}^{Credit}$ is the add-on amount calculated in step 3 for each entity referenced by the derivatives.

39. The following table shows a simple way to calculate the systematic and idiosyncratic components in the formula:

RE	$\rho_{RE\text{-}CR}$	$\mathbf{AddOn_{RE\text{-}CR}^{Credit}}$	$\rho_{RE\text{-}CR} \times AddOn_{RE\text{-}CR}^{Credit}$	$1 - (\rho_{RE\text{-}CR})^2$	$(AddOn_{RE\text{-}CR}^{Credit})^2$	$(1 - (\rho_{RE\text{-}CR})^2) \times (AddOn_{RE\text{-}CR}^{Credit})^2$
Firm A	0.5	106	52.9	0.75	11,207	8,405
Firm B	0.5	−280	−140	0.75	78,353	58,765
CDX.IG	0.8	168	134.5	0.36	28,261	10,174
sum =			47.5			**77,344**
$(sum)^2$ =			**2,253**			

40. According to the calculations in the table, the systematic component is 2,253, while the idiosyncratic component is 77,344. Thus, the add-on for the credit asset class is calculated as follows:

$$AddOn^{Credit} = \sqrt{2{,}253 + 77{,}344} = 282$$

41. For this netting set, the credit add-on ($AddOn^{Credit}$) is also the aggregate add-on ($AddOn^{aggregate}$) because there are no derivatives belonging to other asset classes.

42. The value of the multiplier can now be calculated as follows, using the formula set out in paragraph 15.1 of this Policy Document.

$$\text{multiplier} = \min\left\{1\ ;\ 0.05 + 0.95 \times \exp\left(\frac{-20}{2 \times 0.95 \times 282}\right)\right\} = 0.965$$

43. Finally, aggregating the replacement cost and the potential future exposure (PFE) component and multiplying the result by the alpha factor of 1.4, the exposure value is as follows:

$$\text{Exposure value} = 1.4 \times (0 + 0.965 \times 282) = 381$$

Example 3: Commodity derivatives (unmargined netting set)

44. Netting set 3 consists of three commodity forward contracts. The table below summarises the relevant contractual terms.

Trade no.	Notional	Nature	Underlying	Direction	Residual maturity	Mark-to-market value
1	10,000	Forward	(West Texas Intermediate, or WTI) Crude Oil	Long	9 months	−50
2	20,000	Forward	(Brent) Crude Oil	Short	2 years	−30
3	10,000	Forward	Silver	Long	5 years	100

45. As in the previous two examples, the netting set is not subject to a margin agreement and there is no exchange of collateral at inception (i.e. independent collateral). Thus, the replacement cost is as follows:

$$RC = \max(100 - 30 - 50 - 0; 0) = 20$$

46. Since the netting set is under-collateralised, the value of the multiplier is 1, as explained in paragraph 15.3 of this Policy Document.

47. All the transactions in the netting set belong to the commodities derivatives asset class. The $AddOn^{aggregate}$ for the commodities derivatives asset class can be calculated using the steps set out in paragraph 24 of this Policy Document.

Step 1: Calculate the effective notional for each trade in the netting set

48. For each trade i, the effective notional D is calculated as follows, as set out in paragraph 18.2 of this Policy Document:

$$D = d \times MF \times \delta$$

Where−

(a) d is the adjusted notional of the trade;
(b) δ is the supervisory delta adjustment of the trade; and
(c) MF is the maturity factor.

49. For commodity derivatives, the adjusted notional is defined as the product of the current price of one unit of the commodity (e.g. barrel of oil) and the number of units referenced by the derivative. In this example, it is assumed that the adjusted notional (d) is equal to the notional value.

50. Paragraph 18.10 of this Policy Document sets out the calculation of the maturity factor (MF_i) for unmargined trades. For trades that have a remaining maturity in

excess of one year (trades 2 and 3 in this example), the formula gives a maturity factor of 1. For trade 1, the formula gives the following maturity factor:

$$MF = \sqrt{\frac{\min\{M_i; 1\text{ year}\}}{1\text{ year}}} = \sqrt{\frac{\min\{\frac{9}{12}; 1\}}{1}} = \sqrt{\frac{9}{12}}$$

51. As set out in paragraphs 18.20 to 18.25 of this Policy Document, a supervisory delta is assigned to each trade. In particular–
    (a) Trade 1 and Trade 3 are long in the primary risk factors (WTI Crude Oil and Silver respectively) and are not options. Thus, the supervisory delta is equal to 1 for each trade; and
    (b) Trade 2 is short in the primary risk factor and is not an option. Thus, the supervisory delta is equal to −1.

Trade no.	Notional	Adjusted notional, d	Maturity factor, MF	Delta, δ	Effective notional, D
1	10,000	10,000	$\sqrt{\frac{9}{12}}$	1	8,660
2	20,000	20,000	1	−1	−20,000
3	10,000	10,000	1	1	10,000

Step 2: Allocate the trades in commodities asset class to hedging sets

52. In the commodities asset class, there are four hedging sets consisting of derivatives that reference: energy (trades 1 and 2 in this example), metals (trade 3 in this example), agricultural and other commodities.

Hedging set	Commodity type	Trades
Energy	Crude oil	1 and 2
	Natural gas	None
	Coal	None
	Electricity	None
Metals	Silver	3
	Gold	None
	…	…
Agricultural	…	…
	…	…
Other commodities	…	…

Trade no.	Effective notional, D	Hedging set	Commodity type
1	8,660	Energy	Crude oil
2	−20,000	Energy	Crude oil
3	10,000	Metals	Silver

Step 3: Calculate the combined effective notional for all derivatives within each hedging set that reference the same commodity type (Effective $\text{Notional}_{\text{CoType}}$)

53. Add together the trade-level effective notionals calculated in step 1 which reference that commodity type. For purposes of this calculation, the financial institution can disregard the basis difference between the WTI and Brent forward contracts since the contracts belong to the same commodity type, "Crude Oil" (unless the Bank requires the financial institution to use a more refined definition of commodity types). This step gives the following:

$$\text{Effective Notional}_{\text{CrudeOil}} = 8{,}660 + (-20{,}000) = -11{,}340$$

$$\text{Effective Notional}_{\text{Silver}} = 10{,}000$$

Step 4: Calculate the add-on for each commodity type ($\text{AddOn}_{\text{CoType}}$)

54. Multiply the combined effective notional for that commodity calculated in step 3 by the supervisory factor applicable to that commodity type ($\text{SF}_{\text{CoType}}$), which is set out in paragraph 24.8(a) of this Policy Document. As the factor is 18% for derivatives that reference all types of commodities other than electricity, the calculation is as follows:

$$\text{AddOn}_{\text{CrudeOil}} = -11{,}340 \times 0.18 = -2{,}041$$

$$\text{AddOn}_{\text{Silver}} = 10{,}000 \times 0.18 = 1{,}800$$

Step 5: Calculate the add-on for each hedging set ($\text{AddOn}_{\text{HS-CO}}^{\text{Commodity}}$)

55. Use the following formula:

$$\text{AddOn}_{\text{HS-CO}}^{\text{Commodity}} = \varepsilon_{\text{HS-CO}} \times \sqrt{\left(\sum_{\text{CoType}} \rho_{\text{CoType}} \times \text{AddOn}_{\text{CoType}}\right)^2 + \sum_{\text{CoType}} \left(1 - \left(\rho_{\text{CoType}}\right)^2\right) \times \left(\text{AddOn}_{\text{CoType}}\right)^2}$$

Where–

(a) HS-CO refers to a given hedging set;
(b) $\varepsilon_{\text{HS-CO}}$ equals to 1, in accordance with paragraph 24.7(a) of this Policy Document as the trades are neither basis transactions nor volatility transactions;
(c) the summations are across all commodity types within the hedging set;
(d) CoType refers to a commodity type;
(e) ρ_{CoType} is the supervisory prescribed correlation factor corresponding to the commodity type. As set out in paragraph 24.7(c) of this Policy

Document, the correlation factor is set at 40% for all commodity types; and

(f) $AddOn_{HS\text{-}CO}^{Commodity}$ is the add-on amount calculated in step 4 for each commodity type.

56. In this example, however, there is only one commodity type within the "Energy" hedging set (i.e. Crude Oil). All other commodity types within the energy hedging set (e.g. coal, natural gas etc) have a zero add-on. Therefore, the add-on for the energy hedging set is calculated as follows:

$$AddOn_{Energy} = \varepsilon_{HS\text{-}CO} \times \sqrt{(\rho_{CrudeOil} \times AddOn_{CrudeOil})^2 + (1 - (\rho_{CrudeOil})^2) \times (AddOn_{CrudeOil})^2}$$

$$= 1 \times \sqrt{(0.4 \times (-2{,}041))^2 + (1 - (0.4)^2) \times (-2{,}041)^2} = 2{,}041$$

57. The calculation above shows that when there is only one commodity type within a hedging set, the hedging set add-on is equal (in absolute value) to the commodity type add-on.

58. Similarly, "Silver" is the only commodity type in the "Metals" hedging set, and thus, the add-on for the metals hedging set is as follows:

$$AddOn_{Metals} = Abs(AddOn_{Silver}) = 1{,}800$$

Step 6: Calculate the asset class level add-on ($AddOn^{Commodity}$)

59. Add together all the hedging set level add-ons calculated in Step 5, as follows:

$$AddOn^{Commodity} = \sum_{HS\text{-}CO} AddOn_{HS\text{-}CO}^{Commodity}$$

$$= AddOn_{Energy} + AddOn_{Metals} = 2{,}041 + 1{,}800 = 3841$$

60. For this netting set, the commodity add-on ($AddOn^{Commodity}$) is also the aggregate add-on ($AddOn^{Aggregate}$) because there are no derivatives belonging to other asset classes.

61. Finally, aggregating the replacement cost and the PFE component and multiplying the result by the alpha factor of 1.4, the exposure value is as follows:

$$\text{Exposure value} = 1.4 \times (20 + 1 \times 3{,}841) = 5{,}406$$

Example 4: Interest/profit rate and credit derivatives (unmargined netting set)

62. Netting set 4 consists of the combined trades of Examples 1 and 2. There is no margin agreement and no collateral. The replacement cost of the combined netting set is as follows:

$$RC = \max(30 - 20 + 50 + 20 - 40 + 0; 0) = 40$$

63. The aggregate add-on for the combined netting set is the sum of add-ons for each asset class. In this case, there are two asset classes, interest/profit rates and credit, and the add-ons for these asset classes have been copied from Examples 1 and 2 where:

$$AddOn^{aggregate} = AddOn^{IR} + AddOn^{Credit} = 347 + 282 = 629$$

64. Since V−C is positive, the multiplier is equal to 1. Finally, the exposure value can be calculated as follows:

$$\text{Exposure value} = 1.4 \times (40 + 1 \times 629) = 936$$

Example 5: Interest/profit rate and commodities derivatives (margined netting set)

65. Netting set 5 consists of the combined trades of Examples 1 and 3. However, instead of being unmargined (as assumed in those examples), the trades are subject to a margin agreement with the following specifications:

Margin frequency	Threshold, TH	Minimum transfer amount, MTA	Independent amount, IA	Total net collateral held
Weekly	0	5	150	200

66. The above table depicts a situation in which the financial institution received from the counterparty a net independent amount of 150 (taking into account the net amount of initial margin posted by the counterparty and any unsegregated initial margin posted by the financial institution). The total net collateral held by the financial institution (after the application of haircuts) is 200, which includes 50 for net variation margin received and 150 for net independent amount.

67. The first step is to determine the replacement cost. The net collateral currently held is 200, while the net independent collateral amount (NICA) is equal to the independent amount (that is, 150). The current mark-to-market value of the

trades in the netting set (V) is 80, where it is calculated as the simple algebraic sum (i.e. 30 – 20 + 50 – 50 – 30 + 100 = 80).

68. The replacement cost for margined netting sets is calculated using the formula set out in paragraph 12.2 of this Policy Document. The replacement cost for the netting set in this example is as follows:

$$RC = \max(V - C\ ;\ TH + MTA - NICA;\ 0)$$
$$= \max(80 - 200;\ 0 + 5 - 150;\ 0) = 0$$

69. The next step is to recalculate the interest/profit rate and commodity add-ons based on the value of the maturity factor for margined transactions, which depends on the margin period of risk.

70. For a margined netting set consisting of bilateral OTC derivatives transactions and subjected to daily re-margining, the supervisory floor for the margin period of risk (MPOR) would be 10 business days. However, the MPOR treatment for a netting set that is not subject to daily margin agreement is set out in paragraph 18.16 of this Policy Document. In this example where the re-margining period (N) is five business days, the calculation of MPOR is as follows:

$$MPOR = Floor + N - 1 = 10 + 5 - 1 = 14$$

71. The re-scaled maturity factor for the trades in the netting set is calculated using the formula set out in paragraph 18.13 of this Policy Document. Using the MPOR calculated above and a market convention of 250 business days in the financial year, the maturity factor for all trades in the netting set in this example is calculated as follows:

$$MF_i^{(margined)} = \frac{3}{2}\sqrt{\frac{MPOR_i}{1\ year}} = \frac{3}{2} \times \sqrt{\frac{14}{250}}$$

<u>Interest/profit rate derivatives asset class add-on</u>

72. The effective notional for each trade ($D = d \times MF \times \delta$) calculated in Example 1 of Appendix 6 must be recalculated using the maturity factor for the margined netting set calculated above. The recalculation is as follows:

Trade no.	Notional	Adjusted Notional, d	Maturity factor, MF	Delta, δ	Effective notional, D
1	10,000	78,694	$1.5 \times \sqrt{\frac{14}{250}}$	1	27,934
2	10,000	36,254	$1.5 \times \sqrt{\frac{14}{250}}$	−1	−12,869
3	5,000	37,428	$1.5 \times \sqrt{\frac{14}{250}}$	−0.2694	−3,579

73. Next, the effective notional of each of the three maturity buckets within each hedging set must now be calculated. Before doing the calculation, each trade must be allocated to the hedging set and the maturity bucket. The result of the allocation is as follows:

Trade no.	Effective notional, D	Base currency (Hedging set)	Maturity bucket
1	27,934	USD	3
2	−12,869	USD	2
3	−3,579	EUR	3

74. As there are no maturity buckets within a hedging set with more than one trade, the effective maturity of each maturity bucket is equal to the effective notional of the single trade in each bucket. Specifically–

(a) for the USD hedging set: D^{MB1} is zero, D^{MB2} is −12,869 and D^{MB3} is 27,934; and

(b) for the EUR hedging set: D^{MB1} and D^{MB2} are zero and D^{MB3} is −3,579.

75. Next, the effective notional of each of the two hedging sets (USD and EUR) must be recalculated using the formula set out in paragraph 18 of this Appendix and the updated values of the effective notionals of each maturity bucket. The calculation is as follows:

$$EN_{USD} = \sqrt{(-12{,}869)^2 + (27{,}934)^2 + 1.4 \times (-12{,}869) \times 27{,}934} = 21{,}039$$

$$EN_{EUR} = \sqrt{(-3{,}579)^2} = 3{,}579$$

76. Next, the hedging set level add-ons ($AddOn^{IR}_{HS\text{-}IR}$) must be recalculated by multiplying the recalculated effective notionals of each hedging set by the prescribed supervisory factor of the hedging set ($SF^{IR}_{HS\text{-}IR}$). As set out in paragraph 21 of this Appendix, the supervisory factor is 0.5%. Therefore, the add-on for the USD and EUR hedging sets are respectively as follows:

$$\text{AddOn}_{USD} = 21{,}039 \times 0.005 = 105$$

$$\text{AddOn}_{EUR} = 3{,}579 \times 0.005 = 18$$

77. Finally, the interest/profit rate asset class level add-on (AddOn^{IR}) is recalculated by adding together the USD and EUR hedging set level add-ons, as follows:

$$\text{AddOn}^{IR} = 105 + 18 = 123$$

Commodity derivatives asset class add-on

78. The add-on must also be recalculated using the maturity factor for the margined netting. The effective notional for each trade ($D = d \times MF \times \delta$) is set out in the table as follows:

Trade no.	Notional	Hedging set	Commodity type	Adjusted notional, d_i	Maturity factor, MF_i	Delta, δ_i	Effective notional, D_i
1	10,000	Energy	Crude Oil	10,000	$1.5 \times \sqrt{\frac{14}{250}}$	1	3,550
2	20,000	Energy	Crude Oil	20,000	$1.5 \times \sqrt{\frac{14}{250}}$	−1	−7,100
3	10,000	Metals	Silver	10,000	$1.5 \times \sqrt{\frac{14}{250}}$	1	3,550

79. The combined effective notional for all derivative contracts that reference the same commodity type ($\text{Effective Notional}_{CoType}$) must be recalculated by adding together the trade-level effective notionals above for each commodity type. This gives the following:

$$\text{Effective Notional}_{CrudeOil} = 3{,}550 + (-7{,}100) = -3{,}550$$

$$\text{Effective Notional}_{Silver} = 3{,}550$$

80. The add-on for each commodity type ($\text{AddOn}_{CrudeOil}$ and AddOn_{Silver}) within each hedging set calculated in Example 1 of this Appendix must now be recalculated by multiplying the recalculated combined effective notional for that commodity by the relevant supervisory factor (i.e. 18%), as follows:

$$\text{AddOn}_{CrudeOil} = -3{,}550 \times 0.18 = -639$$

$$\text{AddOn}_{Silver} = 3{,}550 \times 0.18 = 639$$

81. Next, recalculate the add-on for energy and metals hedging sets using the recalculated add-ons for each commodity type above. As noted in Example 3 of this Appendix, when there is only one commodity type within each hedging set, the hedging set level add-on is simply equal to the absolute value of the commodity type add-on. This results in the following:

$$\text{AddOn}_{\text{Energy}} = \text{Abs}(\text{AddOn}_{\text{CrudeOil}}) = 639$$

$$\text{AddOn}_{\text{Metals}} = \text{Abs}(\text{AddOn}_{\text{Silver}}) = 639$$

82. Finally, calculate the commodity asset class level add-on ($\text{AddOn}^{\text{Commodity}}$) by adding together the hedging set level add-ons as follows:

$$\text{AddOn}^{\text{Commodity}} = \sum_{\text{HS-CO}} \text{AddOn}^{\text{Commodity}}_{\text{HS-CO}} = 639 + 639 = 1{,}278$$

83. The aggregate netting set level add-on can now be calculated. As set out in paragraph 16.2 of this Policy Document, it is calculated as the sum of the asset class level add-ons as follows:

$$\text{AddOn}^{\text{aggregate}} = \text{AddOn}^{\text{IR}} + \text{AddOn}^{\text{Commodity}} = 123 + 1{,}278 = 1{,}401$$

84. As seen from paragraph 68 of this Appendix, the value of $V-C$ is negative (i.e. -120) and so, the multiplier will be less than 1. The multiplier is calculated using the formula set out in paragraph 15.1 of this Policy Document, which for this example gives the following:

$$\text{multiplier} = \min\left\{1\ ;\ 0.05 + (0.95 \times \exp\left(\frac{80 - 200}{2 \times 0.95 \times 1{,}401}\right)\right\} = 0.958$$

85. Finally, aggregating the replacement cost and the PFE component as well as multiplying the result by the alpha factor of 1.4, the exposure value is as follows:

$$\text{Exposure value} = 1.4 \times (0 + 0.958 \times 1{,}401) = 1{,}879$$

Example 6: Derivatives with multiple risk drivers (unmargined netting set)

86. Netting set 6 consists of a cross-currency interest rate swap with principal exchange. The table below summarises the relevant contractual terms.

Remaining maturity	Position	Bought amount (CNY' 000)	FX spot rate (Buy)	Sold amount (USD' 000)	FX spot rate (Sold)	Receive leg	Pay leg	Mark-to-market value (RM' 000)
120 business days	Short	351,135	0.6556	50,000	4.717	Fixed	Floating	150

87. In accordance with paragraph 17.1 of this Policy Document, a financial institution is required to allocate the asset class for a derivative transaction based on the determination of its primary risk driver. This should account for the sensitivities and volatility of the underlying exposure that drive the market value or payoff of the derivative transaction.

88. For this example, the financial institution has identified foreign exchange risk as the primary risk driver of this transaction. The transaction is therefore allocated to the foreign exchange derivatives asset class. Note that the primary risk factor would be interest rate, for cross-currency interest rate swap without any principal exchange.

89. The netting set is not subject to a margin agreement and there is no exchange of collateral at inception (i.e. independent collateral). The replacement cost is therefore calculated using the following formula:

$$RC = \max (V - C ; 0)$$

Where−

(a) V is the current mark-to-market value of the derivative contracts in a netting set; and

(b) C is the haircut value of net collateral held, which is zero in this example.

90. Since V is positive and C is zero, RC is just the current mark-to-market value which is RM150,000. As the trade is also under-collateralised, the value of the multiplier is 1.

91. As the netting set consists of a single trade, the aggregate add-on is equal to the foreign exchange derivatives asset class add-on.

Step 1: Calculate the trade-level effective notional in the netting set

92. The effective notional (D) is calculated as follows:

$$D = d \times MF \times \delta$$

Where−

(a) d is the adjusted notional of the trade;
(b) δ is the supervisory delta adjustment of the trade; and
(c) MF is the maturity factor.

93. Paragraph 18.7 of this Policy Document sets out the value of the adjusted notional for a foreign exchange derivative. Where both legs of the transaction are denominated in currencies other than Ringgit, the notional amount for each leg is converted to Ringgit and the leg with the larger value is to be taken as the adjusted notional amount.

Ringgit-equivalent trade notional amount of the buy leg (RM' 000)
= Notional (CNY) × FX Rate to RM = 351,135 × 0.6556 = 230,204

Ringgit-equivalent trade notional amount of the sell leg (RM' 000)
= Notional (USD) × FX Rate to RM = 50,000 × 4.717 = 235,850

94. The adjusted notional in thousands of RM is as follows:

$$\max(230{,}204\ ;\ 235{,}850) = 235{,}850$$

95. Paragraph 18.10 of this Policy Document sets out the calculation of the maturity factor for unmargined trades.

$$MF_i^{(unmargined)} = \sqrt{\frac{\min\{M_i;1\ year\}}{1\ year}}$$

96. The maturity parameter of the trade (M_i) is equal to the transaction's remaining maturity (expressed in years), subject to a floor of 10 business days. Standard market convention is to be used to convert business days into years, and vice versa. The calculation of M_i as follows, assuming that the convention is one year equals to 250 business days:

$$M_i = \max\left(\frac{120}{250}\ ;\ \frac{10}{250}\right) = \frac{12}{25}$$

97. Based on the calculation of the maturity parameter above, the maturity factor of the trade is as follows:

$$MF_i = \sqrt{\frac{\min\{\frac{12}{25};1\}}{1}} = \sqrt{\frac{12}{25}}$$

98. As set out in paragraphs 18.20 to 18.25 of this Policy Document, a supervisory delta is assigned to each trade. The trade is short in the primary risk factor and is not an option. Thus, the supervisory delta is equal to −1.

99. The result of applying the formula as set out in paragraph 92 of this Appendix is as follows:

Adjusted notional, d (RM' 000)	Maturity factor, MF	Delta, δ	Effective notional, D (RM' 000)
235,850	$\sqrt{\frac{12}{25}}$	−1	−163,402

Step 2: Allocate the trades to hedging sets

100. In the foreign exchange derivatives asset class, a hedging set consists of all derivative transactions that reference the same currency pair. In this example, the netting set comprises one hedging set (i.e. USD/CNY).

Step 3: Calculate the effective notional of each hedging set (Effective $\text{Notional}^{FX}_{HS\text{-}FX}$)

101. This is computed by adding together the trade-level effective notionals within the hedging set. Since there is only one trade in the hedging set, the effective notional of the hedging set is equal to the trade-level effective notional.

$$\text{Effective Notional}^{FX}_{USD/CNY}\ (\text{RM' 000}) = -163{,}402$$

Step 4: Calculate the hedging set level add-on ($\text{AddOn}^{FX}_{HS\text{-}FX}$)

102. As set out in paragraph 21.2 of this Policy Document, this is computed as the product of Effective $\text{Notional}^{FX}_{HS\text{-}FX}$, the supervisory factor adjustment ($\varepsilon_{HS\text{-}FX}$) and the supervisory factor of the hedging set ($SF^{FX}_{HS\text{-}FX}$) of 4%. The computation of the add-on for the USD/CNY hedging set is as follows:

$$\text{AddOn}_{USD/CNY}\ (\text{RM' 000}) = \text{Abs}(\text{Effective Notional}^{FX}_{USD/CNY}) \times \varepsilon_{HS\text{-}FX} \times SF^{FX}_{HS\text{-}FX}$$

$$= \text{Abs}(-163{,}402) \times 1 \times 0.04$$
$$= 6{,}536$$

Step 5: Calculate the asset class level add-on ($AddOn^{FX}$)

103. This is computed by adding together all hedging set level add-ons calculated in step 4, as follows:

$$AddOn^{FX}\ (RM'\ 000) = \sum_{HS\text{-}FX} AddOn^{FX}_{HS\text{-}FX} = 6{,}536$$

104. For this netting set, the foreign exchange derivatives asset class add-on is also the aggregate add-on because there are no derivatives belonging to other asset classes. The exposure value for the netting set can now be calculated as follows, using the formula set out in paragraph 9.3 of this Policy Document:

$$\text{Exposure value (RM' 000)} = 1.4 \times (150 + 1 \times 6{,}536) = 9{,}360$$

Example 7: Equity derivatives (unmargined netting set)

105. Netting set 7 consists of two equity volatility swaps. The table below summarises the relevant contractual terms.

Trade no.	Nature	Reference entity	Residual maturity	Notional	Underlying volatility	Position	Mark-to-market value
1	Equity volatility swap	S&P 500	1 year	10,000	20% (annualised)	Long	90
2	Equity volatility swap	Company XYZ	6 months	5,000	22% (annualised)	Short	60

106. The financial institution has identified equity volatility as the primary risk factor for both transactions. The transactions are therefore allocated to the equity derivatives asset class.

107. Further to the asset class allocation, the financial institution needs to allocate the transactions in a netting set into hedging sets. In accordance with paragraph 19.4 of this Policy Document, all equity volatility transactions form a single hedging set.

108. The netting set is not subject to a margin agreement and there is no exchange of collateral at inception (i.e. independent collateral). The replacement cost is calculated using the following formula:

$$RC = \max (V - C\ ;\ 0)$$

Where−
(a) V is a simple algebraic sum of the derivatives' mark-to-market values at the reference date; and
(b) C is the haircut value of net collateral held, which is zero in this example.

109. Using the values indicated in the table, the RC is calculated as follows:

$$RC = \max(90 + 60 - 0; 0) = 150$$

110. Since V−C is positive (i.e. the trade is under-collateralised), the value of the multiplier is 1, as explained in paragraph 15.3 of this Policy Document.

111. All the transactions in the netting set belong to the equity derivatives asset class. Therefore, the $AddOn^{aggregate}$ can be calculated using the steps set out in paragraph 23 of this Policy Document.

Step 1: Calculate the effective notional for each trade in the netting set

112. For each trade i, the effective notional D is calculated as follows, as set out in paragraph 18.2 of this Policy Document:

$$D = d \times MF \times \delta$$

Where−
(a) d is the adjusted notional of the trade;
(b) δ is the supervisory delta adjustment of the trade; and
(c) MF is the maturity factor.

113. For equity derivatives, the adjusted notional (d_i) is the product of the current unit price (e.g. a share of equity) and the number of units referenced by the trade. However, for equity volatility transactions, the underlying volatility or variance referenced by the transaction replaces the unit price whereas the contractual notional replaces the number of units.

$$\text{Adjusted Notional} = \text{Underlying Volatility} \times \text{Contractual Notional}$$

114. For this example, the adjusted notional for each trade are calculated as follows:

Trade no.	Underlying volatility	Notional	Adjusted notional, d
1	20%	10,000	2,000
2	22%	5,000	1,100

115. Paragraph 18.10 of this Policy Document sets out the calculation of the maturity factor for unmargined trades. For trades that have a remaining maturity of one year (trade 1 in this example), the formula gives a maturity factor of 1. For trade 2, the formula gives the following maturity factor:

$$MF_i^{(unmargined)} = \sqrt{\frac{\min\{M_i;1\text{ year}\}}{1\text{ year}}} = \sqrt{\frac{\min\{\frac{6}{12};1\}}{1}} = \sqrt{\frac{6}{12}}$$

116. As set out in paragraphs 18.20 to 18.25 of this Policy Document, a supervisory delta is assigned to each trade. In particular–
   (a) Trade 1 is long in the primary risk factor (the reference volatility) and is not an option. Thus, the supervisory delta is equal to 1; and
   (b) Trade 2 is short in the primary risk factor (the reference volatility) and is not an option. Thus, the supervisory delta is equal to −1.

117. The effective notional for the trade in the netting set is calculated using the formula $D = d \times MF \times \delta$ and values for each term noted above:

Trade no.	Notional	Adjusted notional, d	Maturity factor, MF	Delta, δ	Effective notional, D
1	10,000	2,000	1	1	2,000
2	5,000	1,100	$\sqrt{\frac{6}{12}}$	−1	−778

Step 2: Calculate the combined effective notional for all derivatives that reference the same entity (Effective Notional$^{Equity}_{RE\text{-}EQ}$)

118. Add together the trade-level effective notionals calculated in step 1 that reference that entity. As each equity index should be treated as a separate entity, there is only one trade for each entity and the effective notional of the entity is therefore equal to the trade-level effective notional (D_i).

Step 3: Calculate the add-on for each entity (AddOn$^{Equity}_{RE\text{-}EQ}$)

119. Multiply the combined effective notional for that entity calculated in step 2 by the supervisory factor applicable to the entity ($SF^{Equity}_{RE\text{-}EQ}$). As set out in paragraph 23.5(a) of this Policy Document, the factors vary according to whether the entity is a single name or an index. In particular for–
   (a) Trade 1, the factor is 20% as the entity is an index; and
   (b) Trade 2, the factor is 32% as the entity is a single name.

120. Thus, the add-on for the entity is calculated as follows:

Reference entity	Effective notional, D	Supervisory factor, $SF^{Equity}_{RE\text{-}EQ}$	Entity-level add-on, $AddOn^{Equity}_{RE\text{-}EQ}$
S&P 500	2,000	20%	400
Company XYZ	−778	32%	−249

Step 4: Calculate the asset class level add-on for each entity ($AddOn^{Equity}$)

121. Since the trades in this netting set consist of only volatility transactions, there is only one hedging set in this asset class. The asset class level add-on equals to the hedging set add-on ($AddOn^{Equity}_{HS\text{-}EQ}$), as follows:

$$AddOn^{Equity}_{HS\text{-}EQ} = \varepsilon_{HS\text{-}EQ} \times \sqrt{\underbrace{\left(\sum_{RE\text{-}EQ} \rho_{RE\text{-}EQ} \times AddOn^{Equity}_{RE\text{-}EQ}\right)^2}_{\text{systematic component}} + \underbrace{\sum_{RE\text{-}EQ} \left(1 - \left(\rho_{RE\text{-}EQ}\right)^2\right) \times \left(AddOn^{Equity}_{RE\text{-}EQ}\right)^2}_{\text{idiosyncratic component}}}$$

Where–

(a) HS-EQ refers to a given hedging set;
(b) $\varepsilon_{HS\text{-}EQ}$ equals to 5, in accordance with paragraph 23.4(a) of this Policy Document as the trades consist of volatility transactions;
(c) the summations are across all entities within the hedging set;
(d) RE-EQ refers to the reference entities;
(e) $\rho_{RE\text{-}EQ}$ is the supervisory specified correlation factor corresponding to the entity. As set out in paragraph 23.4(c) of this Policy Document, the correlation factor is 50% for single entities and 80% for indices; and
(f) $AddOn^{Equity}_{RE\text{-}EQ}$ is the add-on amount calculated in step 3 for each entity referenced by the derivatives.

122. The following table shows a simple way to calculate the systematic and idiosyncratic components in the formula:

RE	$\rho_{RE\text{-}EQ}$	$AddOn^{Equity}_{RE\text{-}EQ}$	$\rho_{RE\text{-}EQ} \times AddOn^{Equity}_{RE\text{-}EQ}$	$1 - (\rho_{RE\text{-}EQ})^2$	$\left(AddOn^{Equity}_{RE\text{-}EQ}\right)^2$	$\left(1 - (\rho_{RE\text{-}EQ})^2\right) \times \left(AddOn^{Equity}_{RE\text{-}EQ}\right)^2$
S&P 500	0.8	400	320	0.36	160,000	57,600
Company XYZ	0.5	−249	−124	0.75	61,981	46,486
sum =			196			**104,086**
$(sum)^2$ =			**38,228**			

123. According to the calculations in the table, the systematic component is 38,228, while the idiosyncratic component is 104,086. As the hedging set consists of volatility transactions, the supervisory factor adjustment ($\varepsilon_{HS\text{-}EQ}$) is equal to 5. Thus, the add-on for the equity asset class is calculated as follows:

$$\text{AddOn}^{\text{Equity}} = 5 \times \sqrt{38{,}228 + 104{,}086} = 1{,}886$$

124. For this netting set, the equity add-on ($\text{AddOn}^{\text{Equity}}$) is also the aggregate add-on because there are no derivatives belonging to other asset classes. The exposure value for the netting set can now be calculated using the formula set out in paragraph 9.3 of this Policy Document:

$$\text{Exposure value} = 1.4 \times (150 + 1 \times 1{,}886) = 2{,}851$$

APPENDIX 7 Amendments to the *Leverage Ratio* policy document

1. Under the Basel III framework, the SA-CCR methodology is used as an input for the Leverage Ratio particularly in the calculation of the derivative exposures.

2. In view of this, the Bank is leveraging this Exposure Draft to also consult the industry on the key changes to the *Leverage Ratio* policy document. These proposed changes are in paragraphs 5, 6, 7, 11 and 13 of the *Leverage Ratio* policy document. The details of the proposed changes are provided as per below.

3. The Bank does not plan to issue an Exposure Draft on *Leverage Ratio* to consult the industry on the proposed changes. As such, the Bank invites written feedback on the proposed changes as set out in this Appendix, including Question 6 and suggestions for specific issues or areas to be clarified or elaborated further.

4. The Bank targets to issue the revised policy document on *Leverage Ratio* together with the issuance of the finalised policy document on *Capital Adequacy Framework (Counterparty Credit Risk)*. Both policy documents are expected to come into force concurrently in 2028.

Question 9: Applicability of Leverage Ratio
Applicable to financial holding companies (FHCs)

In addition to the specific amendments below, the Bank plans to extend the scope of application of *Leverage Ratio* to FHCs.

Please describe the constraints faced by your institution, if any, in implementing the *Leverage Ratio* requirements.

5. Interpretation

5.2 [New or amended definitions] For the purpose of this policy document–

"derivative transaction" refers to an OTC derivative transaction or exchange-traded derivative transaction, either of which may be a credit derivative;

"long settlement transaction" refers to a transaction where a counterparty undertakes to deliver a security, a commodity, or a foreign exchange amount against cash, other financial instruments, or commodities, or vice versa, at a settlement or delivery date that is contractually specified as more than the lower of the market standard for this particular instrument and five business days after the date on which the financial institution enters into the transaction;

"multi-level client structure" means a structure where an entity that is neither a member, nor a direct participant, of a CCP but provides clearing services as a client of a clearing member, or as a client of another client of a clearing member. This structure consists of–

(a) **"higher level client"** which refers to an entity which may be the financial institution that provides clearing services to a lower level client; and

(b) **"lower level client"** which refers to an entity which may be the financial institution that clears through a higher level client;

"netting set" refers to a group of transactions with a single counterparty that are subject to a legally enforceable bilateral netting arrangement and for which netting is recognised under paragraph 8 of the policy document on *Capital Adequacy Framework (Counterparty Credit Risk)*. Each transaction that is not subject to a legally enforceable bilateral netting arrangement that is recognised for regulatory capital purposes shall be interpreted as its own netting set; and

"qualifying central counterparty" or **"QCCP"** refers to an entity that meets the criteria set out in paragraph 6.1 of the policy document on *Capital Adequacy Framework (Exposures to Central Counterparties)*.

6. Related legal instruments and policy documents

6.1 [Inclusion of two other policy documents] This policy document must be read together with other relevant legal instruments and policy documents that have been issued by the Bank, including any amendments or reissuance thereafter, in particular–

(a) *Capital Adequacy Framework (Basel II – Risk-Weighted Assets)* (hereafter referred to as "CAF-RWA");
(b) *Capital Adequacy Framework for Islamic Banks (Risk-Weighted Assets)* (hereafter referred to as "CAFIB-RWA");
(c) *Capital Adequacy Framework (Capital Components)* (hereafter referred to as "CAF-Capital Components");
(d) *Capital Adequacy Framework for Islamic Banks (Capital Components)* (hereafter referred to as "CAFIB-Capital Components");
(e) *Investment Account*;
(f) *STATsmart Reporting Requirements on Data Submission for Reporting Entities*;
(g) *Capital Adequacy Framework (Exposures to Central Counterparties)* (hereafter referred to as "CAF CCP"); and
(h) *Capital Adequacy Framework (Counterparty Credit Risk)* (hereafter referred to as "CAF CCR").

7. Policy documents superseded

7.1 [Revised date] This policy document supersedes the policy document on *Leverage Ratio* issued on 8 December 2017.

11. Total LR Exposure

S 11.1 A banking institution must calculate its Total LR Exposure as the sum of the following exposures:

(a) on-balance sheet exposures as set out in paragraph 12;
(b) derivative exposures as set out in paragraph 13;
(c) securities financing transaction exposures as set out in paragraph 14; and
(d) off-balance sheet (OBS) exposures as set out in paragraph 15.

S 11.1 (i) [New] A banking institution shall calculate the exposure of long settlement transactions, as well as unsettled transactions and failed trades (other than SFTs), according to its classification under the banking institution's accounting policies, as follows:

(a) the exposure of a long settlement transaction classified as a derivative transaction under the banking institution's accounting policies must be calculated according to paragraph 13; and
(b) the exposure of an unsettled transaction, or a failed trade, classified as a receivable under the banking institution's accounting policies must be calculated according to paragraph 15.

13. Derivative exposures

S 13.1 [Revised] Subject to paragraphs 13.2, 13.8(iii) and 13.13, a banking institution shall calculate its exposures for all derivative transactions[57] in a netting set using the formula provided below:

$$\text{Derivative exposures} = \text{Alpha} \times (\text{RC} + \text{PFE})$$

Where–

(a) Alpha is set at 1.4;

(b) RC is the replacement cost calculated in accordance with paragraph 13.1(i), or the positive mark-to-market value of the transaction if there is no accounting measure for such instrument because it is held completely off-balance sheet; and

(c) PFE is the amount of potential future exposure calculated in accordance with paragraph 13.1(ii).

S 13.1 (i) [New] A banking institution shall determine the RC as follows:

$$\text{RC} = \max(V - \text{CVM}_r + \text{CVM}_p, 0)$$

Where–

(a) V is the current mark-to-market value of derivative transactions in the netting set;

(b) CVM_r is the cash variation margin received that meets the conditions set out in paragraph 13.4, and for which the amount has not already reduced the mark-to-market value of the derivative transactions under the banking institution's accounting policies; and

(c) CVM_p is the cash variation margin provided by the banking institution and that meets the same conditions as set out in paragraph 13.4.

S 13.1 (ii) [New] A banking institution shall calculate the PFE as follows:

$$\text{PFE} = \text{multiplier} \times \text{AddOn}^{\text{aggregate}}$$

Where–

(a) multiplier is fixed at one; and

(b) $\text{AddOn}^{\text{aggregate}}$ is the aggregate add-on component as set out in paragraph 16 of the CAF CCR policy document[58].

[57] This includes written options, which must be calculated as part of the LR exposure even if the CCR exposure value for certain options shall be set at zero under the CAF CCR policy document.

[58] A banking institution shall apply the lower maturity factor for margined transactions, which would therefore result in the PFE-reducing effect arising from the regular exchange of variation margin.

S 13.2 [Revised] In calculating its derivative exposures, a banking institution–

(a) [Deleted]

(b) must not reduce its derivative exposures through use of any collateral, except as provided under paragraph 13.3[59];

(c) must not apply any haircut for currency risk; and

(d) must comply with the conditions to effect the bilateral netting arrangement as set out in paragraph 8 of the CAF CCR PD, if the banking institution wishes to measure its derivative exposures net.

S 13.5 [Revised] With regards to paragraph 13.4(d), a banking institution shall account for margin disputes such that only the amount of non-disputed variation margin which has been exchanged can be recognised towards the reduction of the derivative exposures.

Treatment of clearing services

S 13.6 [Revised] A banking institution that is a clearing member ("CM") of a CCP and offers clearing services to clients–

(a) must calculate a trade exposure[60] to the CCP, if the banking institution is obligated to reimburse the clients for any losses suffered due to changes in the value of its derivative transactions in the event the CCP defaults; and

(b) shall not be required to recognise the resulting trade exposure to the CCP in its Total LR Exposure if–

(i) the CCP is a QCCP; and

(ii) the banking institution is not obligated to reimburse the clients for any losses suffered in the event the QCCP defaults based on its contractual arrangements with its client.

S 13.8 [New] A banking institution that provides clearing services as a higher level (i) client in a multi-level client structure shall not recognise the resulting trade exposures to the QCCP only if the following conditions are met:

(a) the offsetting transactions are identified by the QCCP as higher level client transactions;

(b) the collateral to support the offsetting transactions is held by the QCCP or the clearing member, or both, under arrangements that prevent any losses to the higher level client due to:

(i) the default or insolvency of the CM;

(ii) the default or insolvency of the CM's other clients; and

(iii) the joint default or insolvency of the CM and any of its other clients;

(c) upon the insolvency of the CM, there is no legal impediment (other than the need to obtain a court order as required or entitled by the client) to transfer the collateral belonging to the clients of a defaulting clearing member to the QCCP, to one or more surviving clearing members, or to the clients or their respective nominees;

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[59] In this regard, the qualifying collateral used towards reducing the derivative exposures is regarded as a pre-settlement payment.

[60] For the avoidance of doubt, this includes initial margin irrespective of whether it is posted in a manner that makes it remote from insolvency of the CCP.

(d) the banking institution has conducted sufficient legal review and has a well-founded basis to conclude that, in the event of a legal challenge, the relevant courts and authorities under their respective jurisdictions would find that the arrangements would be legal, valid, binding and enforceable under the relevant laws of the relevant jurisdictions. The financial institution shall undertake further review as necessary to ensure continuing enforceability of the arrangements[61];

(e) the relevant laws, regulations, rules, contractual arrangements or administrative arrangements provide that the offsetting transactions with the defaulted or insolvent clearing member are highly likely to continue to be indirectly transacted through, or by, the QCCP. In such circumstances, the client positions and collateral held with the QCCP shall be transferred at market value unless the banking institution requests to close out the position at market value; and

(f) the banking institution must not be obligated, based on any contractual arrangements with its clients, to reimburse the clients for any losses suffered in the event of default of either the CM or the QCCP.

S 13.8 (ii) [New] With regards to paragraph 13.8(i)(e), a banking institution shall consider whether the offsetting transactions are highly likely to be ported based on prevailing market practices and precedence. These include whether there is a clear precedent for transactions to be ported at a QCCP and that there is a clear industry intent for such practices to continue. The banking institution shall not determine that the trades are highly likely to be ported solely on the basis that the QCCP documentation that does not prohibit client trades from being ported.

S 13.8 (iii) [New] For derivative transactions associated with a banking institution's offering of clearing services to clients either as a CM (or higher level client in the case of a multi-level client structure), the banking institution must calculate the RC and PFE of the derivative exposures to the client (or lower level client in the case of a multi-level client structure) in accordance with the SA-CCR as set out in the CAF CCR PD subject to the adjustment set out in paragraph 13.8(iv).

S 13.8 (iv) [New] In determining the RC and PFE of the derivative exposures to the client (or lower level client in the case of a multi-level client structure), a banking institution shall restrict the amount of initial margin received from its clients which are recognised in the calculations to the amount that has been appropriately segregated by the banking institution as defined in the relevant jurisdictions.

Additional treatment for written credit derivatives

S 13.9 [Revised] Where a banking institution provides credit protection through a credit derivative (written credit derivative), the banking institution must include

[61] The financial institution shall be required to undertake a review periodically (no later than once every three years) or when there are developments that could impact the enforceability of the arrangements, whichever is earlier.

the effective notional amount[62] referenced by the written credit derivative in the calculation of its derivative exposures except as provided in paragraph 13.9(i).

G 13.9 (i) [New] A banking institution may exclude the effective notional amount of a written credit derivative from its derivative exposures if the written credit derivative is included in a transaction for which the banking institution provides clearing services to a client by acting as–

(a) a CM and the written credit derivative meets both conditions set out in paragraph 13.6(b) such that the resulting trade exposure to the CCP is not required to be recognised in the Total LR Exposure; or

(b) a higher level client and the written credit derivative meets the conditions set out in paragraph 13.8 such that the resulting trade exposure to the QCCP is not required to be recognised in the excluded from the Total LR Exposure.

G 13.10 [Revised] A banking institution may reduce the effective notional amount by the negative fair value of a written credit derivative that has been recognised in the calculation of Tier 1 Capital[63,64].

S 13.10 (i) [New] Where a banking institution implements the reduction as set out in paragraph 13.10 and intends to reduce the resulting amount further by the effective notional amount of a purchased credit derivative on the same reference name[65], the banking institution shall only do so provided that–

(a) the credit protection obtained through the purchased credit derivative is otherwise subject to the same, or more conservative, material terms as those in the corresponding written credit derivative;

(b) the remaining maturity of the purchased credit derivative is equal to, or greater than, the remaining maturity of the written credit derivative;

(c) the credit derivative is not purchased from a counterparty whose credit quality is positively correlated [66] with the value of the reference obligation of the written credit derivative;

(d) in the event that the effective notional amount of a written credit derivative is reduced by any negative fair value reflected in Tier 1 Capital, the effective notional amount of the purchased credit derivative

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62 The effective notional amount is obtained by adjusting the notional amount to reflect the true exposure of contracts that are leveraged or otherwise enhanced by the structure of the transaction.

63 For example, if a written credit derivative had a positive fair value of 20 on one date and has a negative fair value of 10 on a subsequent reporting date, the effective notional amount of the credit derivative may be reduced by 10. The effective notional amount cannot be reduced by 30. However, if on the subsequent reporting date the credit derivative has a positive fair value of 5, the effective notional amount cannot be reduced at all.

64 This treatment is consistent with the rationale that the effective notional amounts included in the Total LR Exposure may be capped at the level of the maximum potential loss, which means that the maximum potential loss at the reporting date is the notional amount of the credit derivative minus any negative fair value that has already reduced Tier 1 Capital.

65 For example, the effective notional amount of a written credit derivative sold to a client may be offset by the effective notional amount of a purchased credit derivative on the same underlying reference name from a CCP.

66 The absence of a legal connection between the counterparty and the underlying reference name of the written credit derivative does not preclude such a positive correlation.

is similarly reduced by any resulting positive fair value reflected in Tier 1 Capital[67]; and

(e) the credit protection obtained through the purchased credit derivative is not covered as part of a transaction where exemption is provided through paragraph 13.9(i).

S 13.10 (ii) [New] With respect to paragraph 13.10(a), material terms shall include optionality, the level of subordination, credit events, reference and any other characteristics relevant to the valuation of the credit derivative. Specifically, a banking institution must observe the following:

(a) for single name credit derivatives, the reference obligation of the purchased credit derivative is–

(i) ranked *pari passu* with the reference obligation of the written credit derivative; or

(ii) ranked junior to the reference obligation of the written credit derivative, and the credit event on the senior reference asset will always result in a credit event on the subordinated reference asset;

(b) for tranched products, the purchased credit derivative must reference an obligation with the same level of seniority as the reference obligation of the written credit derivative; and

(c) in the case of options, the strike price of the underlying purchased credit derivative must be equal to, or lower than, the strike price of the underlying written credit derivative.

S 13.10 (iii) [New] In the case where a written credit derivative is in the form of an option with the obligation to provide credit protection under certain conditions, the effective notional amount of the option shall only be offset by the effective notional of an option by which the banking institution has the right to purchase credit protection subject to meeting the conditions set out in paragraph 13.10(i)(a) to 13.10(i)(e).

G 13.13 [Revised] A banking institution's exposure may be overstated where both the effective notional amount and PFE for written credit derivatives are included in its Total LR Exposure. In this regard, a banking institution may choose to exclude the PFE amount of a written credit derivative if–

(a) the PFE portion of the written credit derivative has not been offset by the effective notional amount of the purchased credit derivative as provided in paragraph 13.10; and

(b) the effective notional amount of the transaction is included as part of the banking institution's derivative exposures.

[67] Where the effective notional amount of the purchased credit derivative has not been reduced by any resulting change in fair value reflected in Tier 1 Capital, then the effective notional amount of the written credit derivative may only be offset if the effective notional amount of that written credit derivative has not been reduced by any change in fair value reflected in Tier 1 Capital.