

Counterparty Credit Risk (CCR)

for Corporate Treasuries

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Counterparty credit risk - terminology

- ▶ **Counterparty credit risk** — is the possibility of incurring a capital loss as a result of a **counterparty to a treasury transaction defaulting** before the final settlement of the transaction's cash flows.

Credit risk calculation



Exposure at Default (EAD)

- ▶ Loans — unilateral risk measured as committed facility limit
- ▶ Derivatives — An economic loss could occur if the transactions with the counterparty has a **positive economic value** (i.e., gain) at the time of default.

Probability of Default (PD)

- ▶ The likelihood of default occurring

Loss Given Default (LGD)

- ▶ Amount not recoverable on default

Forward-looking / multiple scenarios

$$\text{Credit Risk} = \text{EAD} \times \text{PD} \times \text{LGD}$$

Identification of risk

Identification of risk

Sources of exposure

Cash at bank

Contingent exposures -
Acceptance of Bank
Guarantees/Insurance
Bonds/Letters of Credit

Investments

Derivatives

Measurement of exposure

Measurement – Contingent exposures

Source	Description	Measurement methodology
Acceptance of Bank Guarantees/ Letters of Credit	<p>Suppliers/contractors debtors may provide Bank Guarantees/Letters of Credit as credit support, which may be called upon in the event that they don't perform as per contract or, default upon payment.</p> <p>The issuing bank <i>may</i> be called upon to pay the acceptor of the BG/LC <i>if</i> the supplier/debtor breaches contract/ defaults on payment.</p> <p>Initial credit risk lies with the issuer of the BG/LC, i.e., supplier/debtor.</p> <p>Contingent credit risk lies with the issuing bank.</p>	<ul style="list-style-type: none"> ▶ The amount of the Bank Guarantee/Letter of Credit. ▶ Generally not combined with other treasury direct exposures.

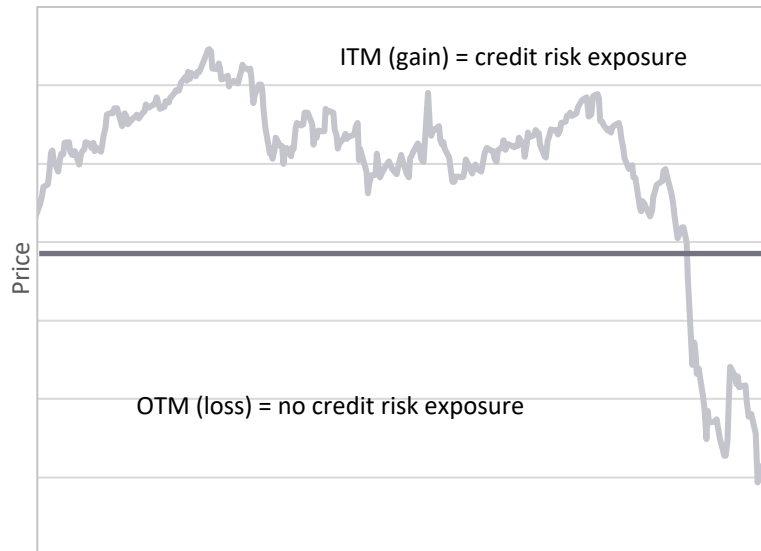
Measurement – Cash at bank and investments

Source	Description	Measurement methodology
Cash at bank	Cash held in bank accounts.	<ul style="list-style-type: none">▶ The closing/end of day balance is used as the amount of the exposure▶ Convert foreign currency balances to functional/ reporting currency▶ Aggregate balances across all bank accounts per bank
Cash investments	Investments in interest bearing instruments, e.g., term deposits or, fixed income securities, i.e., commercial paper, bonds, floating rate notes.	<ul style="list-style-type: none">▶ Notional Principal plus Accrued Interest▶ Alternatives: Principal plus expected interest at maturity or, Face Value▶ Exposure is assessed to instrument issuer, not seller

Measurement – Derivatives

Fair Value Movement

- ▶ Unlike a bank's exposure to credit risk when providing a **loan**, where the exposure to credit risk is *unilateral* and only the lending bank faces the risk of loss, **derivatives** creates a *bilateral* risk of loss ie: the market value of the transaction can be positive or negative to either party to the transaction.



A theoretical example

1. Company A contracts a new FX derivative with Bank A.



2. As currency markets fluctuate over the life of the instrument, the market value of the instrument rises and falls.



3. There is a risk of economic loss if the bank defaults before the final settlement of the transaction.



Determining exposure at default

There are multiple ways to calculate Exposure at Default (EAD):

Increasing degree of complexity



Market Fair Value

- ▶ Based on the derivative's current fair value (MTM).
- ▶ Assumes the current fair value is representative of the future exposure of the derivative.

Regulatory Method

- ▶ Based on APRA/Basel exposure methodologies.
- ▶ Eg: *APS 180* - potential exposure of a five-year Interest Rate Swap is equal to 1.5% of its notional amount *plus* the current mark-to-market value.

Volatility Approach

- ▶ A non-option derivative is replicated in option terms, e.g., an FEC is disaggregated into an FX Call and Put option, with same strike.
- ▶ The appropriate credit spread is then applied to determine net premium, representing EAD.

Monte Carlo Simulation

- ▶ Possible fair values over remaining life are simulated.
- ▶ At each simulation point, the appropriate credit spread is applied to the exposure.
- ▶ Credit spreads are aggregated to give a single adjustment.

Current Exposure

Probable Future Exposure

Exposure at Default – Market Fair Value

Credit Valuation Adjustment (CVA)

- ▶ Accounting purpose: Fair value measurement of a derivative needs to be adjusted to reflect the effect of *non-performance risk* (i.e., credit risk).
- ▶ For purposes of determining the Current Credit Exposure - exclude CVA.
- ▶ Use *risk-free* value as it best represents the current *replacement cost*, i.e., the cost to replace the hedge in the current market.

Note: Bank valuations typically do not include CVA/DVA adjustments.

Exposure at Default – Regulatory Method

Exposure Calculation Methodology as per APS 180 (Attachment E)

For derivative transactions **not covered by an eligible bilateral netting agreement** -

- ▶ Where an ISDA Collateral Support Agreement (CSA) exists and collateral is being posted both ways:
 - ▶ Sum of Current Credit Exposure (CCE) plus the Potential Future Credit Exposure (PFCE)
- ▶ Where no CSA exists:
 - ▶ Adjusted Credit Exposure = Current Credit Exposure (CCE) *plus* **3x** the Potential Future Credit Exposure (PFCE)
- ▶ Definitions:
 - ▶ **Current Credit Exposure (CCE)** = positive mark-to-market value (or replacement cost) of transaction
 - ▶ **Potential Future Credit Exposure (PFCE)** = calculated per table of % add-ons (next page)

For derivative transactions covered by an **eligible bilateral netting agreement** -

- ▶ Where an ISDA Collateral Support Agreement (CSA) exists and collateral is being posted both ways:
 - ▶ Credit Exposure = NCCE (positive) + PFCE adj
- ▶ Where no CSA exists:
 - ▶ Adjusted Credit Exposure = NCCE (positive) + **3x** PFCE adj
- ▶ Definitions:
 - ▶ **NCCE** = the Net Current Credit Exposure (i.e., net mark-to-market) of all transactions covered by the netting agreement
 - ▶ **PFCEadj** = PFCE adjusted to reflect netting agreement

Exposure at Default – Regulatory Method

APS 180 (Attachment E) - Potential Future Credit Exposure (PFCE)

- ▶ The PFCE Amount is calculated by multiplying the notional principal amount of a particular transaction by the relevant **Credit Conversion Factor (CCF)** and adjusting for the eligible collateral and netting.
- ▶ Credit Conversion Factors (CCFs) are outlined in the following table:

Residual maturity	Interest rate contracts (%)	Foreign exchange and gold contracts (%)	Equity contracts (%)	Precious metal contracts (other than gold) (%)	Other commodity contracts (other than precious metals) (%)
≤ 1 year	0	1	6	7	10
>1 year ≤5 years	0.5	5	8	7	12
>5 years	1.5	7.5	10	8	15

Measurement – Derivatives – Regulatory Method Example

Derivative	Notional	Remaining Term	MTM = Current Exposure	PFCE	Total Adjusted Credit Exposure
IRS	\$50m	3yrs	+\$100,000	0.5% x \$50m	+\$100,000+ (0.5% x \$50m) = \$350,000
IRS	\$20m	6yrs	-\$30,000	1.5% x \$20m	\$0 + 1.5% x \$20m = \$300,000
FEC	\$10m	18mths	\$50,000	5% x \$10m	\$50,000+ 5% x \$10m = \$550,000
FEC	\$10m	18mths	-\$50,000	5% x \$10m	\$0+ 5% x \$10m = \$500,000
					\$1.7m

Exposure to Bank A = \$1.7m – this is not the potential or expected loss!

Measurement - Derivatives

1

If the counterparty defaults, what is the exposure at that time?

Expected Positive Exposure (EPE) – The present value of receipts / unrealised gains an entity forecasts to receive from a counterparty.

2

What proportion of exposure might we lose net of recovery?

LGD - a percentage of EPE, typically assumed constant.

3

What is the probability of corporate default and bank survival?

$$PD_{\text{cpty}} \times (1 - PD_{\text{Bank}})$$

$$CVA = EPE_{\text{cpty}} \times LGD_{\text{cpty}} \times PD_{\text{cpty}} \times (1 - PD_{\text{Bank}})$$

- ▶ EPE and PD change throughout the transaction life.
- ▶ PD is calculated from Credit Default Swap prices.

Management of exposure

Management techniques – Investments & Derivatives

Technique	Pros	Cons
Deal with highly rated counterparties.	Lower probability of default (PD)	Opportunity cost of better investment rates or pricing
Expand number of counterparties deal with	Diversification of risk	Creates more operational complexity and operational risk.
Collateralise — Establish ISDA Credit Support Annexes- transfer of collateral (margin) between counterparties	Reduce Exposure at Default (EAD)	Creates operational and liquidity risks
Unwind existing 'in-the-money' hedges and reset at current levels, i.e., take profit	Reduce Exposure at Default (EAD)	Accounting (Hedge accounting if applied) & Tax implications
Establish netting agreements — to allow offsetting 'out-of-the-money' trades against 'in-the-money' trades.	Reduce Exposure at Default (EAD)	Legal risk - Only called upon in event of default and counterparty goes into liquidation
Clearing of derivatives — transfer derivative trade and credit risk to a clearing house. Involves margin calls.	Lower probability of default (PD) Reduce Exposure at Default (EAD)	Creates operational and liquidity risks

Limit structures

- ▶ What is the organisation's approach to credit risk?
 - a) Reduce exposure (EAD) to individual counterparties through diversification.
Or
 - a) Reduce capital loss in event of default.

- ▶ For corporate treasuries - the primary use of derivatives is to manage market risks and counterparty credit risk (CCR) is a subsequent secondary level risk.
- ▶ Therefore, reduction of exposure generally is the primary goal. ie: diversification of risk

- ▶ Therefore, to drive diversification behaviour - limits may be set as a **percentage of overall exposure** to particular counterparties, rather than amount limits.

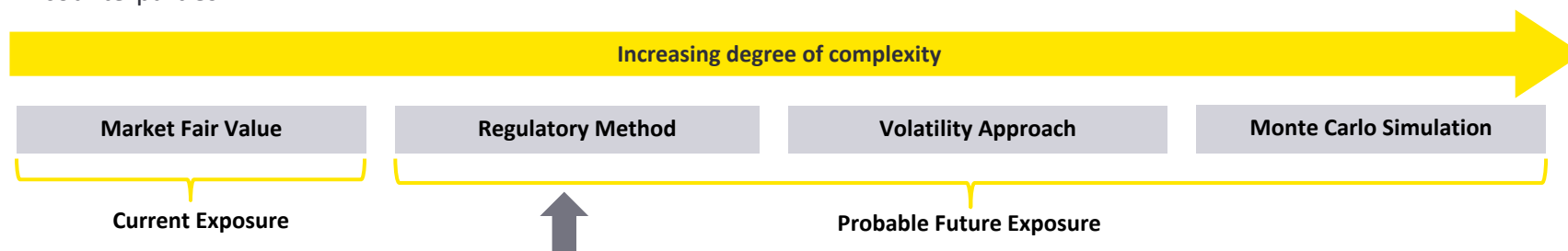
Setting \$ Limits

- ▶ Limits should be aligned to the Risk Appetite Statement (RAS) and risk management framework to determine the acceptable amount of 'Expected Loss Given Default (LGD)'.
- ▶ Typically organisation's appetite for counterparty credit risk is regarded as 'low', which often equates to the likelihood of a default event occurring as 'unlikely' to 'rare' but, could have 'moderate' consequences.
- ▶ This combination leads to a potential financial loss amount, i.e., a maximum expected LGD
- ▶ $\text{Maximum Expected LGD} = \text{EAD Limit} \times \text{PD} \times \text{Recovery rate}.$
- ▶ Work backwards to determine EAD Limit
 - ▶ Risk appetite = LGD
 - ▶ Use Credit Default Swaps to determine PD
 - ▶ Use credit ratings to determine Recovery rate

Case study

Case Study: Transurban Credit Risk

- ▶ Transurban is a major toll road operator that develops and manages urban toll road networks in Australia and North America. It manages A\$37 billion of funding facilities (30 June 2022).
- ▶ Credit risk for Transurban is primarily through cash and investments, and derivative exposures to debt issuances.
- ▶ ISDA set-off provisions form part of the methodology for determining exposures, although netting is consistent across counterparties.



- ▶ Transurban adopts the current exposure plus potential future exposures under a simplified APS180 regulatory method.
- ▶ Cash and investments are the amount held at the close of business each day.
- ▶ Derivatives are marked to market daily using valuations generated by the Treasury Management System across the entire Group.
- ▶ The PFE is calculated as the A\$ equivalent notional value multiplied by the relevant credit conversion factor as referred to in APS180:

Residual maturity*	Multiple (%)		
	Interest rate derivative	FX derivative	Cash deposit
1 year or less	0.0	1	0
>1 year to 5 years	0.5	5	0
>5 years	1.5	7.5	0

Case Study: Transurban Credit Risk

Total Exposure

- ▶ For transactions *not* covered by an eligible bilateral netting agreement:
 - ▶ $CEA = CCE + PFCE$ (note this does not include the 3x multiplier as per APS180, however all counterparties have netting)
- ▶ For transactions that are covered by an eligible bilateral netting agreement:
 - ▶ $CEA = NCCE$ (if positive) + PFCE
 - ▶ Where: NCCE = the net current credit exposure (i.e., net mark-to-market) of all transactions covered by the netting or set-off agreement, if positive
- ▶ Transurban does not post or receive collateral for derivative positions so the PFCEadj methodology outlined in APS180 has been simplified to simply capture the PFCE of existing derivative notional, but recognise the Netting for Current Credit Exposures
- ▶ Bank Guarantees and Letters of Credit are monitored but not included in the credit exposure calculations which vary day to day

Case Study: Transurban Credit Risk

Limit Management

- ▶ There is no defined methodology to set limits that is applied consistently across banks or corporates.
- ▶ Transurban uses a balance sheet metric (EBITDA), and determines limits dependent on counterparty ratings as a percentage of EBITDA.

S&P	Moody's	% of EBITDA (Limit)
AAA	Aa1	X%
Down to	Down to	Lower %
A-	A3	Lowest %

- ▶ Specific limits outside the methodology above, also apply to the major banks with them being recognised as 'Significantly Important FI's (SIFI's), and at some asset levels to support operational activities.

Appendices

A Banking Regulations

APS 112 - Capital Adequacy: Standardised Approach to Credit Risk

- ▶ **Eligible bilateral netting agreement** - An eligible bilateral netting agreement, which includes a master netting agreement, is a netting agreement with a counterparty which:
 - (a) Provides the non-defaulting party the right to terminate and close-out, in a timely manner, all transactions under the netting agreement upon an event of default, including in the event of insolvency or bankruptcy of the counterparty.
 - (b) Provides for the netting of gains and losses on transactions (including the value of any collateral) terminated and closed out under it, so that only a single net amount is owed by one party to the other.
 - (c) Allows for the prompt liquidation or set-off of collateral upon the event of default.
 - (d) Is legally enforceable in each relevant jurisdiction regardless of whether the counterparty is insolvent or bankrupt.
 - (e) Does not include a walkaway clause (i.e., any clause which, in the event of default of a counterparty, permits a non-defaulting counterparty to make limited payments only, or no payments at all, to a defaulting party, even if the defaulting party is a net creditor).
- ▶ **Legal enforceability** - The requirement to ensure that a netting agreement is legally enforceable for both on-balance sheet netting and eligible bilateral netting agreements, requires an ADI to:
 - (a) Obtain a written and reasoned legal opinion that concludes that in the event of default, liquidation, bankruptcy or other similar circumstances of a party to the netting agreement, the relevant courts and authorities would find the ADI's exposure is limited to the single net sum determined in the netting agreement under:
 - (i) The law of the jurisdiction in which the counterparty is incorporated, formed or resides (in the case of a natural person), and if a foreign branch of the counterparty is involved, the law of the jurisdiction in which the branch is located.
 - (ii) The law that governs the individual transactions involved.
 - (iii) The law that governs any contract or agreement necessary to give effect to the netting.

APS 180 Capital Adequacy: Counterparty Credit Risk

- ▶ **Close-out netting** — is the process of combining all outstanding transactions and reducing them to a single net payment in the event of default by a counterparty to a netting agreement.
- ▶ **Netting** — is the process under a netting agreement of combining all relevant outstanding transactions between two counterparties and reducing them to a single net sum for a party to either pay or receive.
- ▶ **Adjusted current exposure method (CEM)** — the adjusted CEM approach for measuring counterparty credit risk exposures is the methodology set out in Attachment E.
- ▶ **Eligible bilateral netting agreement** — has the meaning in paragraph 7 of Attachment I of Prudential Standard APS 112.
- ▶ **Counterparty credit risk exposure amount under the adjusted CEM** - Under the adjusted CEM, the counterparty credit risk exposure amount is the CEA for all OTC derivative transactions with a given counterparty, calculated by adding together:
 - a) The transaction-level CEA calculated under the adjusted CEM methodology in Attachment E for each transaction not covered by an eligible bilateral netting agreement.
 - b) The CEA calculated under the adjusted CEM methodology in Attachment E for transactions covered by an eligible bilateral netting agreement that meet the criteria set out in Attachment I of APS 112 and adjusting the sum for collateral that meets the eligibility criteria for the adjusted CEM set out in Attachment G of APS 112.
- ▶ **Adjustment for CVA** — For all OTC derivative transactions, the counterparty-level EAD or CEA must be adjusted for incurred CVA by subtracting the CVA amount for the counterparty that has already been recognised by the ADI as an incurred write-down (i.e., a CVA loss). The incurred CVA loss must be calculated according to the ADI's own valuation methodology and must not include any debit value adjustment (DVA).

APS 180 Capital Adequacy: Counterparty Credit Risk Attachment E - Adjusted Current Exposure Method

▶ **Calculate CEA in the following manner:**

(a) For market-related transactions that are not covered by an eligible bilateral netting agreement as set out in Attachment I of APS 112:

- ▶ For margined transactions: $CEA = CCE + PFCE$
- ▶ For unmargined transactions: $CEA = CCE + (3 \times PFCE)$
- ▶ Where: CCE = the current credit exposure, calculated as sum of the positive mark-to-market value (or replacement cost) of these transactions
- ▶ PFCE = the potential future credit exposure of these transactions determined in accordance with paragraphs 3 to 11 of this Attachment

▶ **For OTC derivative transactions covered by an eligible bilateral netting agreement that satisfies the requirements in Attachment I of APS 112 for netting, an ADI must calculate the CEA of transactions subject to a netting agreement as:**

- ▶ For netting agreements containing only unmargined transactions: $CEA = NCCE$ (if positive) + $[3 \times PFCE_{adj}]$.
- ▶ Where: NCCE = the net current credit exposure (i.e., net mark-to-market) of all transactions covered by the netting agreement, if positive. NCCE must be calculated as the sum of all positive and negative mark-to-market values of all individual contracts covered by a netting agreement (i.e., positive mark to-market values of transactions may be offset against negative mark-to-market values on other transactions covered by the netting agreement). If the net sum of individual mark-to-market values is positive, the NCCE is equal to that sum. If the sum of mark-to-market values is zero or negative, the NCCE is set equal to zero.
- ▶ $PFCE_{adj}$ = the add-on for potential future credit exposure based on the notional principal of all the individual underlying contracts (i.e., the gross potential future credit exposure ($PFCE_{gross}$) adjusted to reflect the effects of the netting agreement. $PFCE_{adj}$ must be determined in accordance with paragraphs 12 to 17 of this Attachment.

$$A = \frac{PFCE_{gross} \text{ for unmargined transactions in the netting agreement}}{PFCE_{gross} \text{ for all transactions in the netting agreement}}$$

APS 180 Capital Adequacy: Counterparty Credit Risk Attachment E - Adjusted Current Exposure Method

Calculation of potential future credit exposure: transactions that are not covered by an eligible bilateral netting agreement

- ▶ An ADI must, for the purpose of calculating its potential future credit exposure for each transaction, multiply the notional principal amount of each of these transactions by the relevant credit conversion factor (CCF) specified in Table 8.

Table 8: Current exposure method – market-related CCF

Residual maturity	Interest rate contracts (%)	Foreign exchange and gold contracts (%)	Equity contracts (%)	Precious metal contracts (other than gold) (%)	Other commodity contracts (other than precious metals) (%)
≤ 1 year	0	1	6	7	10
> 1 year ≤ 5 years	0.5	5	8	7	12
> 5 years	1.5	7.5	10	8	15

- ▶ Treatment of Basis Swaps — No potential future credit exposure is calculated for single currency floating/floating interest rate swaps as the credit exposure on these contracts must be evaluated solely on the basis of their mark-to-market values.

APS 180 Capital Adequacy: Counterparty Credit Risk Attachment E - Adjusted Current Exposure Method

Calculation of potential future credit exposure: Transactions covered by an eligible bilateral netting agreement

- ▶ An ADI must recognise the effects of netting agreements on its potential future credit exposure by applying the formula below to produce an adjusted add-on amount for potential future credit exposure on all contracts subject to the netting agreement. Thus:
 - ▶ $PFCE_{adj} = 0.4 (PFCE_{gross}) + 0.6 (NGR \times PFCE_{gross})$.
- ▶ The potential future credit exposure ($PFCE_{adj}$) is calculated as the sum of an ADI's potential future credit exposure for each individual transaction covered by a netting agreement with a counterparty as if no netting would occur.
- ▶ For the purpose of calculating $PFCE_{gross}$, an ADI may treat matching transactions included in a netting agreement as a single transaction with a notional principal equivalent to the net receipts on those transactions. For this purpose, matching transactions are defined as forward foreign exchange and other similar market-related transactions in which the notional principal is equivalent to cash flows, where the cash flows fall due on the same value date and are in the same currency.
- ▶ The net-to-gross ratio (NGR) is the ratio of the net current exposure of all transactions included in a netting agreement to the gross current credit exposure (GCCE) of these same transactions. GCCE is the sum of the mark-to-market values of all transactions covered by a netting agreement with a positive mark-to-market value with no offsetting against contracts with a negative mark-to-market value.
- ▶ The NGR reflects the risk reducing portfolio effects of netted transactions with respect to current credit exposure. Thus: $NGR = NCCE/GCCE$.

APS 180 Capital Adequacy: Counterparty Credit Risk

Attachment E - Adjusted Current Exposure Method

The NGR may be calculated using one of the following approaches:

- (a) **Counterparty-by-counterparty approach** – under this approach, a unique NGR is applied to each counterparty in calculating the CEA of transactions with that counterparty.

NGR is defined as the NCCE of all transactions with an individual counterparty covered by a netting agreement (i.e., NCCE_{individual}) divided by the GCCE of all the transactions with that counterparty covered by the netting agreement (i.e., GCCE_{individual}).

In calculating GCCE_{individual}, negative mark-to-market values for individual transactions with the same counterparty may not be used to offset positive mark-to-market values for other transactions with the same counterparty.

Or

- (b) **Aggregate approach** – under this approach a single NGR is calculated and applied to all counterparties in calculating the CEA for transactions with each of those counterparties. The NGR is the ratio of the sum of all NCCEs of all transactions with all counterparties subject to any netting agreement (i.e., NCCE_{aggregate}) to the sum of all of the GCCEs for all transactions of all counterparties subject to any netting agreement (i.e., GCCE_{aggregate}).

In calculating GCCE_{aggregate}, negative mark-to-market values of transactions with one counterparty cannot be used to offset positive mark-to-market values of transactions with that counterparty or any other counterparty included in the aggregate calculations.

APS 180, Attachment E - Implications

If *no* netting applies: $CEA = CCE + (3x PFCE)$

- ▶ $CCE = \text{MTM}, \text{min } 0$
- ▶ $PFCE = CCF \times \text{Notional}$
- ▶ $CCFs = \text{table paragraph 3}$

If netting applies: $CEA = NCCE + (3x PFCEAdj)$

- ▶ $NCCE = \text{Net MTM}, \text{min } 0$
- ▶ $PFCEAdj = 0.4 \times PFCE_{\text{gross}} + 0.6 \times NGR \times PFCE_{\text{gross}}$
- ▶ $PFCE_{\text{gross}} = CCF \times \text{Notional}$
- ▶ $CCFs = \text{table paragraph 3}$
- ▶ $NGR = NCCE/GCCE$ (+ve MTM only)

B ISDA Master Agreements

ISDA – Payments Netting

Section 2c) Obligations – Netting of Payments

- ▶ If on any date amounts would otherwise be payable:
 - ▶ (i) In the same currency
 - ▶ (ii) In respect of the same Transaction
- ▶ By each party to the other, then, on such date, each party’s obligation to make payment of any such amount will be automatically satisfied and discharged and, if the aggregate amount that would otherwise have been payable by one party exceeds the aggregate amount that would otherwise have been payable by the other party, replaced by an obligation upon the party by which the larger aggregate amount would have been payable to pay to the other party the excess of the larger aggregate amount over the smaller aggregate amount.
- ▶ The parties may elect in respect of two or more Transactions that a net amount and payment obligation will be determined in respect of all amounts payable on the same date in the same currency in respect of those Transactions, regardless of whether such amounts are payable in respect of the same Transaction. The election may be made in the Schedule or any Confirmation by specifying that “Multiple Transaction Payment Netting” applies to the Transactions identified as being subject to the election (in which case clause (ii) above will not apply to such Transactions). If Multiple Transaction Payment Netting is applicable to Transactions, it will apply to those Transactions with effect from the starting date specified in the Schedule or such Confirmation, or, if a starting date is not specified in the Schedule or such Confirmation, the starting date otherwise agreed by the parties in writing. This election may be made separately for different groups of Transactions and will apply separately to each pairing of Offices through which the parties make and receive payments or deliveries.

ISDA – Close Out Netting/Set-Off

Section 6 Early Termination: Close Out Netting

- ▶ (e) **Payments on Early Termination.** If an Early Termination Date occurs, the amount, if any, payable in respect of that Early Termination Date (the “Early Termination Amount*”) will be determined pursuant to this Section 6(e) and will be subject to Section 6(f).
 - ▶ (i) **Events of Default.** If the Early Termination Date results from an Event of Default, the Early Termination Amount will be an amount equal to (1) the sum of (A) the Termination Currency Equivalent of the Close-out Amount or Close-out Amounts (whether positive or negative) determined by the Non defaulting Party for each Terminated Transaction or group of Terminated Transactions, as the case may be, and (B) the Termination Currency Equivalent of the Unpaid Amounts owing to the Non-defaulting Party less (2) the Termination Currency Equivalent of the Unpaid Amounts owing to the Defaulting Party. If the Early Termination Amount is a positive number, the Defaulting Party will pay it to the Non-defaulting Party; if it is a negative number, the Non-defaulting Party will pay the absolute value of the Early Termination Amount to the Defaulting Party.
- ▶ (f) **Set-Off.** Any Early Termination Amount payable to one party (the “Payee”) by the other party (the “Payer”), in circumstances where there is a Defaulting Party or where there is one Affected Party in the case where either a Credit Event Upon Merger has occurred or any other Termination Event in respect of which all outstanding Transactions are Affected Transactions has occurred, will, at the option of the Non-defaulting Party or the Non- affected Party, as the case may be (“X”) (and without prior notice to the Defaulting Party or the Affected Party, as the case may be), be reduced by its set-off against any other amounts (“Other Amounts”) payable by the Payee to the Payer (whether or not arising under this Agreement, matured or contingent and irrespective of the currency, place of payment or place of booking of the obligation). To the extent that any Other Amounts are so set-off, those Other Amounts will be discharged promptly and in all respects. X will give notice to the other party of any set-off effected under this Section 6(f).

ISDA – Definitions

Section 14 Definitions

- ▶ **“Close-out Amount”** means, with respect to each Terminated Transaction or each group of Terminated Transactions and a Determining Party, the amount of the losses or costs of the Determining Party that are or would be incurred under then prevailing circumstances (expressed as a positive number) or gains of the Determining Party that are or would be realised under then prevailing circumstances (expressed as a negative number) in replacing, or in providing for the Determining Party the economic equivalent of, (a) the material terms of that Terminated Transaction or group of Terminated Transactions, including the payments and deliveries by the parties under Section 2(a)(i) in respect of that Terminated Transaction or group of Terminated Transactions that would, but for the occurrence of the relevant Early Termination Date, have been required after that date (assuming satisfaction of the conditions precedent in Section 2(a)(iii)) and (b) the option rights of the parties in respect of that Terminated Transaction or group of Terminated Transactions.
- ▶ Any Close-out Amount will be determined by the Determining Party (or its agent), which will act in good faith and use commercially reasonable procedures in order to produce a commercially reasonable result. The Determining Party may determine a Close-out Amount for any group of Terminated Transactions or any individual Terminated Transaction but, in the aggregate, for not less than all Terminated Transactions. Each Close-out Amount will be determined as of the Early Termination Date or, if that would not be commercially reasonable, as of the date or dates following the Early Termination Date as would be commercially reasonable.

ISDA – Schedule to the Master Agreement – Examples

Part 4 Miscellaneous – Netting of Payments

- ▶ Example 1 - “Multiple Transaction Payment Netting” will not apply for the purpose of Section 2(c) of this Agreement to all Transactions, unless otherwise agreed between the parties from time to time.
- ▶ Example 2 - “Multiple Transaction Payment Netting” will apply for the purpose of Section 2(c) of this Agreement to the following Transactions or group of Transactions: All Transactions being of the same type and which have been entered into through the same office of Party A (Bank)

Part 5 Other Provisions – Determining Close-out Amount

- ▶ Example 1 - The definition of “Close-out Amount” is amended by the insertion of the following sentence at the end of the definition: “A Close-out Amount is not required to be the market value of the Terminated Transaction or group of Terminated Transactions and, subject to Section 6(e)(ii)(3), the Determining Party is not obliged to use mid-market quotations or mid-market valuations in determining a Close-out Amount.

ISDA – Schedule to the Master Agreement – Examples

Part 5 Other Provisions – Set-Off

Example 1 – Section 6 (f) of the Agreement shall be deleted and replaced with the following:

- ▶ (f) Set-Off
 - ▶ (i) In addition to any rights of set-off a party may have as a matter of law or otherwise, upon the occurrence of an Event of Default with respect to a party hereof (“X”) or a Termination Event where X is the sole Affected Party and all Transactions are Affected Transactions, the other party (“Y”) shall have the right (but shall not be obliged) without prior notice to X or any other person to set off and Early Termination Amount payable by one party (“the Payer”) to the other party (“the Payee”) (regardless of the currency, place of payment or booking office of the obligation) against any amount payable by the Payee to the Payer (whether or not arising under this Agreement, whether or not matured, whether or not contingent and regardless of the currency, place of payment or booking office of the obligation, provided that unmatured, unascertained or contingent liabilities shall only be included where an Early termination Date is designated as a result of an Event of Default). Y will give notice to X of any set-off effected under this Section 6 (f).
 - ▶ (ii) For the purpose of cross-currency set off, Y may convert any obligation to another currency at a market rate determined by Y in good faith and using commercially reasonable procedures.

C Credit ratings

Credit Ratings – Short Term

Recognised short-term ratings and equivalent credit rating grades

Credit Rating Grade	S&P Rating	Moody's	Fitch
1	A-1	P-1	F-1
2	A-2	P-2	F-2
3	A-3	P-3	F-3
4	Others	Others	Others

Reference: APS 112, Appendix F

Credit Ratings – Long Term

Recognised long-term ratings and equivalent credit rating grades

Credit Rating Grade	S&P Rating	Moody's	Fitch
1	AAA	Aaa	AAA
	AA+	Aa1	AA+
	AA	Aa2	AA
	AA-	Aa3	AA-
2	A+	A1	A+
	A	A2	A
	A-	A3	A-
3	BBB+	Baa1	BBB+
	BBB	Baa2	BBB
	BBB-	Baa3	BBB-
4	BB+	Ba1	BB+
	BB	Ba2	BB
	BB-	Ba3	BB-
5	B+	B1	B+
	B	B2	B
	B-	B3	B-
6	CCC+	Caa1	CCC+
	CCC	Caa2	CCC
	CCC-	Caa3	CCC-
	CC	Ca	CC
	C	C	C
	D		D

Reference: APS 112, Appendix F

S&P Ratings – Corporate Default Rates

Recognised short-term ratings and equivalent credit rating grades

Rating	1	2	3	4	3	6	7	8	9	10
AAA	0.00	0.03	0.13	0.24	0.34	0.45	0.50	0.58	0.64	0.69
AA	0.02	0.06	0.11	0.20	0.30	0.40	0.48	0.55	0.62	0.68
A	0.05	0.13	0.21	0.32	0.44	0.57	0.73	0.87	1.01	1.15
BBB	0.15	0.41	0.72	1.09	1.48	1.85	2.18	2.50	2.80	3.10
BB	0.60	1.88	3.35	4.81	6.19	7.47	8.57	9.56	10.45	11.24
B	3.18	7.46	11.26	14.30	16.67	18.59	20.10	21.34	22.45	23.50
OCC/C	26.55	36.74	41.80	44.74	46.91	47.95	49.08	49.82	50.48	51.05
Investment-grade	0.08	0.23	0.40	0.61	0.83	1.05	1.26	1.45	1.63	1.81
Speculative-grade	3.60	6.97	9.86	12.23	14.16	15.75	17.06	18.16	19.14	20.04
All rated	1.50	2.93	4.17	5.22	6.10	6.83	7.45	7.97	8.43	8.36

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