# Annex 4

## Treatment of Counterparty Credit Risk and Cross-Product Netting

1. This rule identifies permissible methods for estimating the Exposure at Default (EAD) or the exposure amount for instruments with counterparty credit risk (CCR) under this Framework.[237] Banks may seek supervisory approval to make use of an internal modelling method meeting the requirements and specifications identified herein. As alternatives banks may also use the standardised method or the current exposure method.

## I. Definitions and general terminology

2. This section defines terms that will be used throughout this text.

### A. General terms

- **Counterparty Credit Risk (CCR)** is the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. An economic loss would occur if the transactions or portfolio of transactions with the counterparty has a positive economic value at the time of default. Unlike a firm's exposure to credit risk through a loan, where the exposure to credit risk is unilateral and only the lending bank faces the risk of loss, CCR creates a bilateral risk of loss: 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.

### B. Transaction types

- **Long Settlement Transactions** are transactions 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 bank enters into the transaction.
- **Securities Financing Transactions (SFTs)** are transactions such as repurchase agreements, reverse repurchase agreements, security lending and borrowing, and margin lending transactions, where the value of the transactions depends on market valuations and the transactions are often subject to margin agreements.
- **Margin Lending Transactions** are transactions in which a bank extends credit in connection with the purchase, sale, carrying or trading of securities. Margin lending transactions do not include other loans that happen to be secured by securities

[237] In the present document, the terms "exposure at default" and "exposure amount" are used together in order to identify measures of exposure under both an IRB and a standardised approach for credit risk.

collateral. Generally, in margin lending transactions, the loan amount is collateralised by securities whose value is greater than the amount of the loan.

## C. Netting sets, hedging sets, and related terms

- **Netting Set** is a group of transactions with a single counterparty that are subject to a legally enforceable bilateral netting arrangement and for which netting is recognised for regulatory capital purposes under the provisions of paragraphs 96 (i) to 96 (v) of this Annex, this Framework text on credit risk mitigation techniques, or the Cross-Product Netting Rules set forth in this Annex. Each transaction that is not subject to a legally enforceable bilateral netting arrangement that is recognised for regulatory capital purposes should be interpreted as its own netting set for the purpose of these rules.
- **Risk Position** is a risk number that is assigned to a transaction under the CCR standardised method (set out in this Annex) using a regulatory algorithm.
- **Hedging Set** is a group of risk positions from the transactions within a single netting set for which only their balance is relevant for determining the exposure amount or EAD under the CCR standardised method.
- **Margin Agreement** is a contractual agreement or provisions to an agreement under which one counterparty must supply collateral to a second counterparty when an exposure of that second counterparty to the first counterparty exceeds a specified level.
- **Margin Threshold** is the largest amount of an exposure that remains outstanding until one party has the right to call for collateral.
- **Margin Period of Risk** is the time period from the last exchange of collateral covering a netting set of transactions with a defaulting counterpart until that counterpart is closed out and the resulting market risk is re-hedged.
- **Effective Maturity under the Internal Model Method** for a netting set with maturity greater than one year is the ratio of the sum of expected exposure over the life of the transactions in a netting set discounted at the risk-free rate of return divided by the sum of expected exposure over one year in a netting set discounted at the risk-free rate. This effective maturity may be adjusted to reflect rollover risk by replacing expected exposure with effective expected exposure for forecasting horizons under one year. The formula is given in paragraph 38.
- **Cross-Product Netting** refers to the inclusion of transactions of different product categories within the same netting set pursuant to the Cross-Product Netting Rules set out in this Annex.
- **Current Market Value (CMV)** refers to the net market value of the portfolio of transactions within the netting set with the counterparty. Both positive and negative market values are used in computing CMV.

## D. Distributions

- **Distribution of Market Values** is the forecast of the probability distribution of net market values of transactions within a netting set for some future date (the forecasting horizon) given the realised market value of those transactions up to the present time.
- **Distribution of Exposures** is the forecast of the probability distribution of market values that is generated by setting forecast instances of negative net market values

equal to zero (this takes account of the fact that, when the bank owes the counterparty money, the bank does not have an exposure to the counterparty).

- **Risk-Neutral Distribution** is a distribution of market values or exposures at a future time period where the distribution is calculated using market implied values such as implied volatilities.
- **Actual Distribution** is a distribution of market values or exposures at a future time period where the distribution is calculated using historic or realised values such as volatilities calculated using past price or rate changes.

## E. Exposure measures and adjustments

- **Current Exposure** is the larger of zero, or the market value of a transaction or portfolio of transactions within a netting set with a counterparty that would be lost upon the default of the counterparty, assuming no recovery on the value of those transactions in bankruptcy. Current exposure is often also called Replacement Cost.
- **Peak Exposure** is a high percentile (typically 95% or 99%) of the distribution of exposures at any particular future date before the maturity date of the longest transaction in the netting set. A peak exposure value is typically generated for many future dates up until the longest maturity date of transactions in the netting set.
- **Expected Exposure** is the mean (average) of the distribution of exposures at any particular future date before the longest-maturity transaction in the netting set matures. An expected exposure value is typically generated for many future dates up until the longest maturity date of transactions in the netting set.
- **Effective Expected Exposure** at a specific date is the maximum expected exposure that occurs at that date or any prior date. Alternatively, it may be defined for a specific date as the greater of the expected exposure at that date, or the effective exposure at the previous date. In effect, the Effective Expected Exposure is the Expected Exposure that is constrained to be non-decreasing over time.
- **Expected Positive Exposure (EPE)** is the weighted average over time of expected exposures where the weights are the proportion that an individual expected exposure represents of the entire time interval. When calculating the minimum capital requirement, the average is taken over the first year or, if all the contracts in the netting set mature before one year, over the time period of the longest-maturity contract in the netting set.
- **Effective Expected Positive Exposure (Effective EPE)** is the weighted average over time of effective expected exposure over the first year, or, if all the contracts in the netting set mature before one year, over the time period of the longest-maturity contract in the netting set where the weights are the proportion that an individual expected exposure represents of the entire time interval.
- **Credit Valuation Adjustment** is an adjustment to the mid-market valuation of the portfolio of trades with a counterparty. This adjustment reflects the market value of the credit risk due to any failure to perform on contractual agreements with a counterparty. This adjustment may reflect the market value of the credit risk of the counterparty or the market value of the credit risk of both the bank and the counterparty.
- **One-Sided Credit Valuation Adjustment** is a credit valuation adjustment that reflects the market value of the credit risk of the counterparty to the firm, but does not reflect the market value of the credit risk of the bank to the counterparty.

### F. CCR-related risks

- **Rollover Risk** is the amount by which expected positive exposure is understated when future transactions with a counterpart are expected to be conducted on an ongoing basis, but the additional exposure generated by those future transactions is not included in calculation of expected positive exposure.
- **General Wrong-Way Risk** arises when the probability of default of counterparties is positively correlated with general market risk factors.
- **Specific Wrong-Way Risk** arises when the exposure to a particular counterpart is positively correlated with the probability of default of the counterparty due to the nature of the transactions with the counterparty.

## II. Scope of application

3. The methods for computing the exposure amount under the standardised approach for credit risk or EAD under the internal ratings-based (IRB) approach to credit risk described in this Annex are applicable to SFTs and OTC derivatives.

4. Such instruments generally exhibit the following abstract characteristics:

- The transactions generate a current exposure or market value.
- The transactions have an associated random future market value based on market variables.
- The transactions generate an exchange of payments or an exchange of a financial instrument (including commodities) against payment.
- The transactions are undertaken with an identified counterparty against which a unique probability of default can be determined[238].

5. Other common characteristics of the transactions to be covered may include the following:

- Collateral may be used to mitigate risk exposure and is inherent in the nature of some transactions.
- 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.
- Netting may be used to mitigate the risk.
- Positions are frequently valued (most commonly on a daily basis), according to market variables.
- Remargining may be employed.

[238] Transactions for which the probability of default is defined on a pooled basis are not included in this treatment of CCR.

6. An exposure value of zero for counterparty credit risk can be attributed to derivative contracts or SFTs that are outstanding with a central counterparty (e.g. a clearing house). This does not apply to counterparty credit risk exposures from derivative transactions and SFTs that have been rejected by the central counterparty. Furthermore, an exposure value of zero can be attributed to banks' credit risk exposures to central counterparties that result from the derivative transactions, SFTs or spot transactions that the bank has outstanding with the central counterparty. This exemption extends in particular to credit exposures from clearing deposits and from collateral posted with the central counterparty. A central counterparty is an entity that interposes itself between counterparties to contracts traded within one or more financial markets, becoming the legal counterparty such that it is the buyer to every seller and the seller to every buyer. In order to qualify for the above exemptions, the central counterparty CCR exposures with all participants in its arrangements must be fully collateralized on a daily basis, thereby providing protection for the central counterparty's CCR exposures. Assets held by a central counterparty as a custodian on the bank's behalf would not be subject to a capital requirement for counterparty credit risk exposure.

7. Under all of the three methods identified in this Annex, when a bank purchases credit derivative protection against a banking book exposure, or against a counterparty credit risk exposure, it will determine its capital requirement for the hedged exposure subject to the criteria and general rules for the recognition of credit derivatives, i.e. substitution or double default rules as appropriate. Where these rules apply, the exposure amount or EAD for counterparty credit risk from such instruments is zero.

8. The exposure amount or EAD for counterparty credit risk is zero for sold credit default swaps in the banking book where they are treated in the framework as a guarantee provided by the bank and subject to a credit risk charge for the full notional amount.

9. Under all three methods identified in this Annex, the exposure amount or EAD for a given counterparty is equal to the sum of the exposure amounts or EADs calculated for each netting set with that counterparty.

## III. Cross-product netting rules[239]

10. Banks that receive approval to estimate their exposures to CCR using the internal model method may include within a netting set SFTs, or both SFTs and OTC derivatives subject to a legally valid form of bilateral netting that satisfies the following legal and operational criteria for a Cross-Product Netting Arrangement (as defined below). The bank must also have satisfied any prior approval or other procedural requirements that its national supervisor determines to implement for purposes of recognising a Cross-Product Netting Arrangement.

[239] These Cross-Product Netting Rules apply specifically to netting across SFTs, or to netting across both SFTs and OTC derivatives, for purposes of regulatory capital computation under IMM. They do not revise or replace the rules that apply to recognition of netting within the OTC derivatives, repo-style transaction, and margin lending transaction product categories under the 1988 Accord, as amended, or in this Framework. The rules in the 1988 Accord and this Framework continue to apply for purposes of regulatory capital recognition of netting within product categories under IMM or other relevant methodology.

***Legal Criteria***

11. The bank has executed a written, bilateral netting agreement with the counterparty that creates a single legal obligation, covering all included bilateral master agreements and transactions ("Cross-Product Netting Arrangement"), such that the bank would have either a claim to receive or obligation to pay only the net sum of the positive and negative (i) close-out values of any included individual master agreements and (ii) mark-to-market values of any included individual transactions (the "Cross-Product Net Amount"), in the event a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances.

12. The bank has written and reasoned legal opinions that conclude with a high degree of certainty that, in the event of a legal challenge, relevant courts or administrative authorities would find the firm's exposure under the Cross-Product Netting Arrangement to be the Cross-Product Net Amount under the laws of all relevant jurisdictions. In reaching this conclusion, legal opinions must address the validity and enforceability of the entire Cross-Product Netting Arrangement under its terms and the impact of the Cross-Product Netting Arrangement on the material provisions of any included bilateral master agreement.

- The laws of "all relevant jurisdictions" are: (i) the law of the jurisdiction in which the counterparty is chartered and, if the foreign branch of a counterparty is involved, then also under 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.
- A legal opinion must be generally recognised as such by the legal community in the firm's home country or a memorandum of law that addresses all relevant issues in a reasoned manner.

13. The bank has internal procedures to verify that, prior to including a transaction in a netting set, the transaction is covered by legal opinions that meet the above criteria.

14. The bank undertakes to update legal opinions as necessary to ensure continuing enforceability of the Cross-Product Netting Arrangement in light of possible changes in relevant law.

15. The Cross-Product Netting Arrangement does not include a walkaway clause. A walkaway clause is a provision which permits a non-defaulting counterparty to make only limited payments, or no payment at all, to the estate of the defaulter, even if the defaulter is a net creditor.

16. Each included bilateral master agreement and transaction included in the Cross-Product Netting Arrangement satisfies applicable legal requirements for recognition of (i) bilateral netting of derivatives contracts in paragraphs 96(i) to 96(v) of this Annex, or (ii) credit risk mitigation techniques in Part 2, Section II.D of this Framework.

17. The bank maintains all required documentation in its files.

***Operational Criteria***

18. The supervisory authority is satisfied that the effects of a Cross-Product Netting Arrangement are factored into the firm's measurement of a counterparty's aggregate credit risk exposure and that the bank manages its counterparty credit risk on such basis.

19. Credit risk to each counterparty is aggregated to arrive at a single legal exposure across products covered by the Cross-Product Netting Arrangement. This aggregation must be factored into credit limit and economic capital processes.

## IV. Approval to adopt an internal modelling method to estimate EAD

20. A bank (meaning the individual legal entity or a group) that wishes to adopt an internal modelling method to measure exposure or EAD for regulatory capital purposes must seek approval from its supervisor. The internal modelling method is available both for banks that adopt the internal ratings-based approach to credit risk and for banks for which the standardised approach to credit risk applies to all of their credit risk exposures. The bank must meet all of the requirements given in Section V of this Annex and must apply the method to all of its exposures that are subject to counterparty credit risk, except for long settlement transactions.

21. A bank may also choose to adopt an internal modelling method to measure CCR for regulatory capital purposes for its exposures or EAD to only OTC derivatives, to only SFTs, or to both, subject to the appropriate recognition of netting specified above. The bank must apply the method to all relevant exposures within that category, except for those that are immaterial in size and risk. During the initial implementation of the internal models method, a bank may use the standardised method or the current exposure method for a portion of its business. The bank must submit a plan to its supervisor to bring all material exposures for that category of transactions under the internal model method.

22. For all OTC derivative transactions and for all long settlement transactions for which a bank has not received approval from its supervisor to use the internal models method, the bank must use either the standardised method or the current exposure method. Combined use of the current exposure method and the standardised method is permitted on a permanent basis within a group. Combined use of the current exposure method and the standardised method within a legal entity is only permissible for the cases indicated in paragraph 90 of this Annex.

23. Exposures or EAD arising from long settlement transactions can be determined using any of the three methods identified in this document regardless of the methods chosen for treating OTC derivatives and SFTs. In computing capital requirements for long settlement transactions banks that hold permission to use the internal ratings-based approach may opt to apply the risk weights under this Framework's standardised approach for credit risk on a permanent basis and irrespective to the materiality of such positions.

24. After adoption of the internal model method, the bank must comply with the above requirements on a permanent basis. Only under exceptional circumstances or for immaterial exposures can a bank revert to either the current exposure or standardised methods for all or part of its exposure. The bank must demonstrate that reversion to a less sophisticated method does not lead to an arbitrage of the regulatory capital rules.

## V. Internal Model Method: measuring exposure and minimum requirements

### A. Exposure amount or EAD under the internal model method

25. CCR exposure or EAD is measured at the level of the netting set as defined in Sections I and III of this Annex. A qualifying internal model for measuring counterparty credit exposure must specify the forecasting distribution for changes in the market value of the netting set attributable to changes in market variables, such as interest rates, foreign exchange rates, etc. The model then computes the firm's CCR exposure for the netting set at each future date given the changes in the market variables. For margined counterparties, the model may also capture future collateral movements. Banks may include eligible financial

collateral as defined in paragraphs 146 and 703 of this Framework in their forecasting distributions for changes in the market value of the netting set, if the quantitative, qualitative and data requirements for internal model method are met for the collateral.

26. To the extent that a bank recognises collateral in exposure amount or EAD via current exposure, a bank would not be permitted to recognise the benefits in its estimates of LGD. As a result, the bank would be required to use an LGD of an otherwise similar uncollateralised facility. In other words, the bank would be required to use an LGD that does not include collateral that is already included in EAD.

27. Under the Internal Model Method, the bank need not employ a single model. Although the following text describes an internal model as a simulation model, no particular form of model is required. Analytical models are acceptable so long as they are subject to supervisory review, meet all of the requirements set forth in this section and are applied to all material exposures subject to a CCR-related capital charge as noted above, with the exception of long settlement transactions, which are treated separately, and with the exception of those exposures that are immaterial in size and risk.

28. Expected exposure or peak exposure measures should be calculated based on a distribution of exposures that accounts for the possible non-normality of the distribution of exposures, including the existence of leptokurtosis ("fat tails"), where appropriate.

29. When using an internal model, exposure amount or EAD is calculated as the product of alpha times Effective EPE, as specified below:

$$\text{EAD} = \alpha \times \text{Effective EPE} \qquad (1)$$

30. Effective EPE ("Expected Positive Exposure") is computed by estimating expected exposure ($EE_t$) as the average exposure at future date $t$, where the average is taken across possible future values of relevant market risk factors, such as interest rates, foreign exchange rates, etc. The internal model estimates $EE$ at a series of future dates $t_1$, $t_2$, $t_3$…[240] Specifically, "Effective EE" is computed recursively as

$$\text{Effective } EE_{t_k} = \max(\text{Effective } EE_{t_{k-1}}, EE_{t_k}) \qquad (2)$$

where the current date is denoted as $t_0$ and Effective $EE_{t_0}$ equals current exposure.

31. In this regard, "Effective EPE" is the average Effective $EE$ during the first year of future exposure. If all contracts in the netting set mature before one year, EPE is the average of expected exposure until all contracts in the netting set mature. Effective EPE is computed as a weighted average of Effective EE:

$$\textit{Effective EPE} = \sum_{k=1}^{\min(1\textit{year}, \textit{maturity})} \textit{Effective}\, EE_{t_k} \times \Delta t_k \qquad (3)$$

where the weights $\Delta t_k = t_k - t_{k-1}$ allows for the case when future exposure is calculated at dates that are not equally spaced over time.

[240] In theory, the expectations should be taken with respect to the actual probability distribution of future exposure and not the risk-neutral one. Supervisors recognise that practical considerations may make it more feasible to use the risk-neutral one. As a result, supervisors will not mandate which kind of forecasting distribution to employ.

32. Alpha ($\alpha$) is set equal to 1.4.

33. Supervisors have the discretion to require a higher alpha based on a firm's CCR exposures. Factors that may require a higher alpha include the low granularity of counterparties; particularly high exposures to general wrong-way risk; particularly high correlation of market values across counterparties; and other institution-specific characteristics of CCR exposures.

## B. Own estimates for alpha

34. Banks may seek approval from their supervisors to compute internal estimates of alpha subject to a floor of 1.2, where alpha equals the ratio of economic capital from a full simulation of counterparty exposure across counterparties (numerator) and economic capital based on EPE (denominator), assuming they meet certain operating requirements. Eligible banks must meet all the operating requirements for internal estimates of EPE and must demonstrate that their internal estimates of alpha capture in the numerator the material sources of stochastic dependency of distributions of market values of transactions or of portfolios of transactions across counterparties (e.g. the correlation of defaults across counterparties and between market risk and default).

35. In the denominator, EPE must be used as if it were a fixed outstanding loan amount.

36. To this end, banks must ensure that the numerator and denominator of alpha are computed in a consistent fashion with respect to the modelling methodology, parameter specifications and portfolio composition. The approach used must be based on the firm's internal economic capital approach, be well-documented and be subject to independent validation. In addition, banks must review their estimates on at least a quarterly basis, and more frequently when the composition of the portfolio varies over time. Banks must assess the model risk.

37. Where appropriate, volatilities and correlations of market risk factors used in the joint simulation of market and credit risk should be conditioned on the credit risk factor to reflect potential increases in volatility or correlation in an economic downturn. Internal estimates of alpha should take account of the granularity of exposures.

## C. Maturity

38. If the original maturity of the longest-dated contract contained in the set is greater than one year, the formula for effective maturity (M) in paragraph 320 of this Framework is replaced with the following:

$$M = \frac{\sum_{k=1}^{t_k \le 1year} Effective\,EE_k \times \Delta t_k \times df_k + \sum_{t_k > 1year}^{maturity} EE_k \times \Delta t_k \times df_k}{\sum_{k=1}^{t_k \le 1year} Effective\,EE_k \times \Delta t_k \times df_k}$$

where $df_k$ is the risk-free discount factor for future time period $t_k$ and the remaining symbols are defined above. Similar to the treatment under corporate exposures, M has a cap of five years.[241]

39. For netting sets in which all contracts have an original maturity of less than one year, the formula for effective maturity (M) in paragraph 320 of this Framework is unchanged and a floor of one year applies, with the exception of short-term exposures as described in paragraphs 321 to 323 of this Framework.

## D. Margin agreements

40. If the netting set is subject to a margin agreement and the internal model captures the effects of margining when estimating EE, the model's EE measure may be used directly in equation (2). Such models are noticeably more complicated than models of EPE for unmargined counterparties. As such, they are subject to a higher degree of supervisory scrutiny before they are approved, as discussed below.

41. A bank that can model EPE without margin agreements but cannot achieve the higher level of modelling sophistication to model EPE with margin agreements can use the following method for margined counterparties. The method is a simple and conservative approximation to Effective EPE and sets Effective EPE for a margined counterparty equal to the lesser of:

- The threshold, if positive, under the margin agreement plus an add-on that reflects the potential increase in exposure over the margin period of risk. The add-on is computed as the expected increase in the netting set's exposure beginning from current exposure of zero over the margin period of risk.[242] A supervisory floor of five business days for netting sets consisting only of repo-style transactions subject to daily remargining and daily mark-to-market, and 10 business days for all other netting sets is imposed on the margin period of risk used for this purpose;
- Effective EPE without a margin agreement.

## E. Model validation

42. Because counterparty exposures are driven by movements in market variables, the validation of an EPE model is similar to the validation of a Value-at-Risk (VaR) model that is used to measure market risk. Therefore, in principle, the qualitative standards in paragraph 718 (LXXIV) for the use of VaR models should be carried over to EPE models. However, an EPE model has additional elements that require validation:

- Interest rates, foreign exchange rates, equity prices, commodities, and other market risk factors must be forecast over long time horizons for measuring counterparty exposure. The performance of the forecasting model for market risk factors must be

[241] Conceptually, M equals the effective credit duration of the counterparty exposure. A bank that uses an internal model to calculate a one-sided credit valuation adjustment (CVA) can use the effective credit duration estimated by such a model in place of the above formula with prior approval of its supervisor.

[242] In other words, the add-on equals EE at the end of the margin period of risk assuming current exposure of zero. Since no roll-off of transactions would be occurring as part of this EE calculation, there would be no difference between EE and Effective EE.

validated over a long time horizon. In contrast, VaR for market risk is measured over a short time horizon (typically, one to ten days).

- The pricing models used to calculate counterparty exposure for a given scenario of future shocks to market risk factors must be tested as part of the model validation process. These pricing models may be different from those used to calculate VaR over a short horizon. Pricing models for options must account for the nonlinearity of option value with respect to market risk factors.
- An EPE model must capture transaction-specific information in order to aggregate exposures at the level of the netting set. Banks must verify that transactions are assigned to the appropriate netting set within the model.
- An EPE model must also include transaction-specific information in order to capture the effects of margining. It must take into account both the current amount of margin and margin that would be passed between counterparties in the future. Such a model must account for the nature of margin agreements (unilateral or bilateral), the frequency of margin calls, the margin period of risk, the threshold of unmargined exposure the bank is willing to accept, and the minimum transfer amount. Such a model must either model the mark-to-market change in the value of collateral posted or apply this Framework's rules for collateral.

43. Static, historical backtesting on representative counterparty portfolios must be part of the model validation process. At regular intervals as directed by its supervisor, a bank must conduct such backtesting on a number of representative counterparty portfolios (actual or hypothetical). These representative portfolios must be chosen based on their sensitivity to the material risk factors and correlations to which the bank is exposed.

44. Starting at a particular historical date, backtesting of an EPE model would use the internal model to forecast each portfolio's probability distribution of exposure at various time horizons. Using historical data on movements in market risk factors, backtesting then computes the actual exposures that would have occurred on each portfolio at each time horizon assuming no change in the portfolio's composition. These realised exposures would then be compared with the model's forecast distribution at various time horizons. The above must be repeated for several historical dates covering a wide range of market conditions (e.g. rising rates, falling rates, quiet markets, volatile markets). Significant differences between the realised exposures and the model's forecast distribution could indicate a problem with the model or the underlying data that the supervisor would require the bank to correct. Under such circumstances, supervisors may require additional capital. Unlike the backtesting requirement for VaR models prescribed in paragraph 718(Lxxiv) (b) and 718(xcviii), no particular statistical test is specified for backtesting of EPE models.

45. Under the internal model method, a measure that is more conservative than Effective EPE (e.g. a measure based on peak rather than average exposure) for every counterparty may be used in place of alpha times Effective EPE in equation (1) with the prior approval of the supervisor. The degree of relative conservatism will be assessed upon initial supervisory approval and subject to periodic validation.

46. Banks using an EPE model or a VaR model (as described in paragraphs 178 to 181 of this Framework) must meet the above validation requirements.

## F. Operational requirements for EPE models

47. In order to be eligible to adopt an internal model for estimating EPE arising from CCR for regulatory capital purposes, a bank must meet the following operational requirements. These include meeting the requirements related to the qualifying standards on

CCR Management, a use test, stress testing, identification of wrong-way risk, and internal controls.

### *Qualifying standards on CCR Management*

48. The bank must satisfy its supervisor that, in addition to meeting the operational requirements identified in paragraphs 49 to 69 below, it adheres to sound practices for CCR management, including those specified in paragraphs 777 (i) to 777 (xiv) of this Framework.

### *Use test*

49. The distribution of exposures generated by the internal model used to calculate effective EPE must be closely integrated into the day-to-day CCR management process of the bank. For example, the bank could use the peak exposure from the distributions for counterparty credit limits or expected positive exposure for its internal allocation of capital. The internal model's output must accordingly play an essential role in the credit approval, counterparty credit risk management, internal capital allocations, and corporate governance of banks that seek approval to apply such models for capital adequacy purposes. Models and estimates designed and implemented exclusively to qualify for the internal models method are not acceptable.

50. A bank must have a credible track record in the use of internal models that generate a distribution of exposures to CCR. Thus, the bank must demonstrate that it has been using an internal model to calculate the distributions of exposures upon which the EPE calculation is based that meets broadly the minimum requirements for at least one year prior to supervisory approval.

51. Banks employing the internal model method must have an independent control unit that is responsible for the design and implementation of the firm's CCR management system, including the initial and on-going validation of the internal model. This unit must control input data integrity and produce and analyse reports on the output of the firm's risk measurement model, including an evaluation of the relationship between measures of risk exposure and credit and trading limits. This unit must be independent from business credit and trading units; it must be adequately staffed; it must report directly to senior management of the firm. The work of this unit should be closely integrated into the day-to-day credit risk management process of the firm. Its output should accordingly be an integral part of the process of planning, monitoring and controlling the firm's credit and overall risk profile.

52. The internal model used to generate the distribution of exposures must be part of a counterparty risk management framework that includes the identification, measurement, management, approval and internal reporting of counterparty risk.[243] This Framework must include the measurement of usage of credit lines (aggregating counterparty exposures with other credit exposures) and economic capital allocation. In addition to EPE (a measure of future exposure), a bank must measure and manage current exposures. Where appropriate, the bank must measure current exposure gross and net of collateral held. The use test is satisfied if a bank uses other counterparty risk measures, such as peak exposure or potential future exposure (PFE), based on the distribution of exposures generated by the same model to compute EPE.

[243] This section draws heavily on the Counterparty Risk Management Policy Group's paper, *Improving Counterparty Risk Management Practices* (June 1999); a copy can be found online at http://www.mfainfo.org/washington/derivatives/Improving%20Counterparty%20risk.pdf.

53. A bank is not required to estimate or report EE daily, but to meet the use test it must have the systems capability to estimate EE daily, if necessary, unless it demonstrates to its supervisor that its exposures to CCR warrant some less frequent calculation. It must choose a time profile of forecasting horizons that adequately reflects the time structure of future cash flows and maturity of the contracts. For example, a bank may compute EE on a daily basis for the first ten days, once a week out to one month, once a month out to eighteen months, once a quarter out to five years and beyond five years in a manner that is consistent with the materiality and composition of the exposure.

54. Exposure must be measured out to the life of all contracts in the netting set (not just to the one year horizon), monitored and controlled. The bank must have procedures in place to identify and control the risks for counterparties where exposure rises beyond the one-year horizon. Moreover, the forecasted increase in exposure must be an input into the firm's internal economic capital model.

### *Stress testing*

55. A bank must have in place sound stress testing processes for use in the assessment of capital adequacy. These stress measures must be compared against the measure of EPE and considered by the bank as part of its internal capital adequacy assessment process. Stress testing must also involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a firm's credit exposures and assessment of the firm's ability to withstand such changes. Examples of scenarios that could be used are; (i) economic or industry downturns, (ii) market-place events, or (iii) decreased liquidity conditions.

56. The bank must stress test its counterparty exposures including jointly stressing market and credit risk factors. Stress tests of counterparty risk must consider concentration risk (to a single counterparty or groups of counterparties), correlation risk across market and credit risk (for example, a counterparty for which a large market move would result in a large exposure, a material deterioration in credit quality, or both), and the risk that liquidating the counterparty's positions could move the market. Such stress tests must also consider the impact on the firm's own positions of such market moves and integrate that impact in its assessment of counterparty risk.

### *Wrong-way risk*

57. Banks must be aware of exposures that give rise to a greater degree of general wrong-way risk.

58. A bank is said to be exposed to "specific wrong-way risk" if future exposure to a specific counterparty is expected to be high when the counterparty's probability of default is also high. For example, a company writing put options on its own stock creates wrong-way exposures for the buyer that is specific to the counterparty. A bank must have procedures in place to identify, monitor and control cases of specific wrong way risk, beginning at the inception of a trade and continuing through the life of the trade.

### *Integrity of Modelling Process*

59. Other operational requirements focus on the internal controls needed to ensure the integrity of model inputs; specifically, the requirements address the transaction data, historical market data, frequency of calculation, and valuation models used in measuring EPE.

60. The internal model must reflect transaction terms and specifications in a timely, complete, and conservative fashion. Such terms include, but are not limited to, contract notional amounts, maturity, reference assets, collateral thresholds, margining arrangements,

netting arrangements, etc. The terms and specifications must reside in a secure database that is subject to formal and periodic audit. The process for recognising netting arrangements must require signoff by legal staff to verify the legal enforceability of netting and be input into the database by an independent unit. The transmission of transaction terms and specifications data to the internal model must also be subject to internal audit and formal reconciliation processes must be in place between the internal model and source data systems to verify on an ongoing basis that transaction terms and specifications are being reflected in EPE correctly or at least conservatively.

61. The internal model must employ current market data to compute current exposures. When using historical data to estimate volatility and correlations, at least three years of historical data must be used and must be updated quarterly or more frequently if market conditions warrant. The data should cover a full range of economic conditions, such as a full business cycle. A unit independent from the business unit must validate the price supplied by the business unit. The data must be acquired independently of the lines of business, must be fed into the internal model in a timely and complete fashion, and maintained in a secure database subject to formal and periodic audit. Banks must also have a well-developed data integrity process to scrub the data of erroneous and/or anomalous observations. To the extent that the internal model relies on proxy market data, for example for new products where three years of historical data may not be available, internal policies must identify suitable proxies and the bank must demonstrate empirically that the proxy provides a conservative representation of the underlying risk under adverse market conditions. If the internal model includes the effect of collateral on changes in the market value of the netting set, the bank must have adequate historical data to model the volatility of the collateral

62. The EPE model (and modifications made to it) must be subject to an internal model validation process. The process must be clearly articulated in firms' policies and procedures. The validation process must specify the kind of testing needed to ensure model integrity and identify conditions under which assumptions are violated and may result in an understatement of EPE. The validation process must include a review of the comprehensiveness of the EPE model, for example such as whether the EPE model covers all products that have a material contribution to counterparty risk exposures.

63. The use of an internal model to estimate EPE, and hence the exposure amount or EAD, of positions subject to a CCR capital charge will be conditional upon the explicit approval of the firm's supervisory authority. Home and host country supervisory authorities of banks that carry out material trading activities in multiple jurisdictions will work co-operatively to ensure an efficient approval process.

64. In this Framework and in prior documents, the Committee has issued guidance regarding the use of internal models to estimate certain parameters of risk and determine minimum capital charges against those risks. Supervisors will require that banks seeking to make use of internal models to estimate EPE meet similar requirements regarding, for example, the integrity of the risk management system, the skills of staff that will rely on such measures in operational areas and in control functions, the accuracy of models, and the rigour of internal controls over relevant internal processes. As an example, banks seeking to make use of an internal model to estimate EPE must demonstrate that they meet the Committee's general criteria for banks seeking to make use of internal models to assess market risk exposures, but in the context of assessing counterparty credit risk.[244]

[244] See Part 2, Section VI D 1 (paragraphs 718 (LXX) to 718 (LXXIII).

65. Pillar 2 of this Framework provides general background and specific guidance to cover counterparty credit risks that may not be fully covered by the Pillar 1 process.

66. No particular form of model is required to qualify to make use of an internal model. Although this text describes an internal model as a simulation model, other forms of models, including analytic models, are acceptable subject to supervisory approval and review. Banks that seek recognition for the use of an internal model that is not based on simulations must demonstrate to their supervisors that the model meets all operational requirements.

67. For a bank that qualifies to net transactions, the bank must have internal procedures to verify that, prior to including a transaction in a netting set, the transaction is covered by a legally enforceable netting contract that meets the applicable requirements of paragraphs 96(I) to 96(v) of this Annex, this Framework text on credit risk mitigation techniques, or the Cross-Product Netting Rules set forth in this Annex.

68. For a bank that makes use of collateral to mitigate its CCR, the bank must have internal procedures to verify that, prior to recognising the effect of collateral in its calculations, the collateral meets the appropriate legal certainty standards as set out in Part 2, Section II.D of this Framework.

## VI. Standardised Method

69. Banks that do not have approval to apply the internal models method for the relevant OTC transactions may use the standardised method. The standardised method can be used only for OTC derivatives; SFTs are subject to the treatments set out under the Internal Model Method of this Annex or under the Part 2, Section II.D, of this Framework. The exposure amount (under the standardised approach for credit risk) or EAD is to be calculated separately for each netting set. It is determined as follows:

$$\text{exposure amount or EAD} = \beta \cdot \max\left( CMV - CMC; \sum_j \left| \sum_i RPT_{ij} - \sum_l RPC_{lj} \right| \times CCF_j \right)$$

where:

CMV = current market value of the portfolio of transactions within the netting set with a counterparty gross of collateral, i.e. $CMV = \sum_i CMV_i$, where $CMV_i$ is the current market value of transaction i.

CMC = current market value of the collateral assigned to the netting set, i.e. $CMC = \sum_l CMC_l$, where $CMC_l$ is the current market value of collateral l.

i = index designating transaction.

l = index designating collateral.

j = index designating supervisory hedging sets. These hedging sets correspond to risk factors for which risk positions of opposite sign

can be offset to yield a net risk position on which the exposure measure is then based.

$RPT_{ij}$ = Risk position from *transaction* i with respect to hedging set j [245].

$RPC_{lj}$ = Risk position from collateral l with respect to hedging set j.

$CCF_j$ = Supervisory credit conversion factor with respect to the hedging set j[246].

$\beta$ = Supervisory scaling parameter.

Collateral received from a counterparty has a positive sign; collateral posted to a counterparty has a negative sign.

Collateral that is recognised for the standardised approach is confined to the collateral that is eligible under paragraphs 146 and 703 of this Framework for credit risk mitigation.

70. When an OTC derivative transaction with linear risk profile (e.g. a forward, a future or a swap agreement) stipulates the exchange of a financial instrument (e.g. a bond, an equity, or a commodity) for a payment, the payment part is referred to as the payment leg. Transactions that stipulate the exchange of payment against payment (e.g. an interest rate swap or a foreign exchange forward) consist of two payment legs. The payment legs consist of the contractually agreed gross payments, including the notional amount of the transaction. Banks may disregard the interest rate risk from payment legs with a remaining maturity of less than one year from the following calculations. Banks may treat transactions that consist of two payment legs that are denominated in the same currency (e.g. interest rate swaps) as a single aggregate transaction. The treatment for payment legs applies to the aggregate transaction.

71. Transactions with linear risk profiles that have equity (including equity indices), gold, other precious metals or other commodities as the underlying financial instruments are mapped to a risk position in the respective equity (or equity index) or commodity (including gold and the other precious metals) hedging set. The payment leg of these transactions is mapped to an interest rate risk position within the appropriate interest rate hedging set. If the payment leg is denominated in a foreign currency, the transaction is also mapped to a foreign exchange risk position in the respective currency.

72. Transactions with linear risk profiles that have a debt instrument (e.g. a bond or a loan) as the underlying instrument are mapped to an interest rate risk positions with one risk position for the debt instrument and another risk position for the payment leg. Transactions with linear risk profiles that stipulate the exchange of payment against payment (including foreign exchange forwards) are mapped to an interest rate risk position for each of the payment legs. If the underlying debt instrument is denominated in a foreign currency, the debt instrument is mapped to a foreign exchange risk position in the respective currency. If a

[245] E.g. a short-term FX forward with one leg denominated in the firm's domestic currency will be mapped into three risk positions: 1. an FX risk position, 2. a foreign currency interest rate risk position, 3. a domestic currency risk position.

[246] Calibration has been made assuming at the money forwards or swaps and given a forecasting horizon of one year.

payment leg is denominated in a foreign currency, the payment leg is also mapped to a foreign exchange risk position in this currency.[247] The exposure amount or EAD assigned to a foreign exchange basis swap transactions is zero.

73. For all but debt instruments, the size of a risk position from a transaction with linear risk profile is the effective notional value (market price multiplied by quantity) of the underlying financial instruments (including commodities) converted to the firm's domestic currency.

74. For debt instruments and the payment legs of all transactions, the size of the risk position is the effective notional value of the outstanding gross payments (including the notional amount) converted to the firm's domestic currency, multiplied by the modified duration of the debt instrument or payment leg, respectively.

75. The size of a risk position from a credit default swap is the notional value of the reference debt instrument multiplied by the remaining maturity of the credit default swap.

76. The size of a risk position from an OTC derivative with non-linear risk profile (including options and swaptions) is equal to the delta equivalent effective notional value of the financial instrument that underlies the transaction, except in the case of an underlying debt instrument.

77. For OTC derivative with non-linear risk profiles (including options and swaptions), for which the underlying is a debt instrument or a payment leg, the size of the risk position is equal to the delta equivalent effective notional value of the financial instrument or payment leg multiplied by the modified duration of the debt instrument or payment leg.

78. Banks may use the following formulas to determine the size and sign of a risk position:

a. for all but debt instruments:

effective notional value, or delta equivalent notional value =

$$p_{ref} \frac{\partial V}{\partial p}$$

where

$p_{ref}$ price of the underlying instrument, expressed in the reference currency

v value of the financial instrument (in the case of an option: option price; in the case of a transaction with a linear risk profile: value of the underlying instrument itself)

p price of the underlying instrument, expressed in the same currency as v

b. for debt instruments and the payment legs of all transactions:

[247] E.g. a short-term FX forward with one leg denominated in the firm's domestic currency will be mapped into three risk positions: 1. an FX risk position, 2. a foreign currency interest rate risk position, 3. a domestic currency risk position.

effective notional value multiplied by the modified duration, or

delta equivalent in notional value multiplied by the modified duration

$$\frac{\partial V}{\partial r}$$

where

v value of the financial instrument (in the case of an option: option price; in the case of a transaction with a linear risk profile: value of the underlying instrument itself or of the payment leg, respectively)

r interest level

If v is denominated in a currency other than the reference currency, the derivative must be converted into the reference currency by multiplication with the relevant exchange rate.

79. The risk positions are to be grouped into hedging sets. For each hedging set, the absolute value amount of the sum of the resulting risk positions is computed. This sum is termed the “net risk position” and is represented as

$$\left| \sum_i RPT_{ij} - \sum_l RPC_{lj} \right|$$

in the formulas in paragraph 70 of this Annex.

80. Interest rate positions arising from debt instruments of low specific risk are to be mapped into one of six hedging sets for each represented currency. A debt instrument is classified as being of low specific risk when it is subject to a 1.6 percent or lower capital charge according to paragraphs 710 to 711(ii). Interest rate positions arising from the payment legs are to be assigned to the same hedging sets as interest rate risk positions from debt instruments of low specific risk. Interest rate positions arising from money deposits received from the counterparty as collateral are also to be assigned to the same hedging sets as interest rate risk positions from debt instruments of low specific risk. The six hedging sets per currency are defined by a combination of two criteria:

(i) The nature of the referenced interest rate — either a sovereign (government) rate or some other rate.

(ii) The remaining maturity or rate-adjustment frequency — less than one year, between one and five years, or longer than five years.

Table 1

**Hedging Sets for Interest Rate Risk Positions Per Currency**

| Remaining maturity or rate-adjustment frequency | Sovereign-referenced interest rates | Non-sovereign-referenced interest rates |
|---|---|---|
| One year or less | X | X |
| Over one year to five years | X | X |
| Over five years | X | X |

81. For underlying debt instruments (e.g. floating rate notes) or payment legs (e.g. floating rate legs of interest swaps) for which the interest rate is linked to a reference interest rate that represents a general market interest level (e.g. government bond yield, money market rate, swap rate), the rate-adjustment frequency is the length of the time interval up to the next re-adjustment of the reference interest rate. Otherwise, the remaining maturity is the remaining life of the underlying debt instrument, or, in the case of a payment leg, the remaining life of the transaction.

82. There is one hedging set for each issuer of a reference debt instrument that underlies a credit default swap.

83. There is one hedging set for each issuer of a debt instrument of high specific risk, i.e. debt instruments to which a capital charge of more than 1.60 percent applies under the standardised measurement method for interest rate risk in paragraph 710. The same applies to money deposits that are posted with a counterparty as collateral when that counterparty does not have debt obligations of low specific risk outstanding. When a payment leg emulates a debt instrument of high specific risk (e.g. in the case of a total return swap with one leg that emulates a bond), there is also one hedging set for each issuer of the reference debt instrument. Banks may assign risk positions that arise from debt instruments of a certain issuer or from reference debt instruments of the same issuer that are emulated by payment legs or that underlie a credit default swap to the same hedging set.

84. Underlying financial instruments other than debt instruments (equities, precious metals, commodities, other instruments), are assigned to the same respective hedging sets only if they are identical or similar instruments. The similarity of instruments is established as follows:

- For equities, similar instruments are those of the same issuer. An equity index is treated as a separate issuer.
- For precious metals, similar instruments are those of the same metal. A precious metal index is treated as a separate precious metal.
- For commodities, similar instruments are those of the same commodity. A commodity index is treated as a separate commodity.
- For electric power, delivery rights and obligations that refer to the same peak or off-peak load time interval within any 24 hour interval are similar instruments.

85. The credit conversion factor that is applied to a net risk position from a hedging set depends on the supervisory hedging set category as given in paragraphs 86 to 88 of this Annex.

86. The credit conversion factors for underlying financial instruments other than debt instruments and for foreign exchange rates are given in Table 2.

Table 2

| Exchange Rates | Gold | Equity | Precious Metals (except gold) | Electric Power | Other Commodities (excluding precious metals) |
|---|---|---|---|---|---|
| 2.5% | 5.0% | 7.0% | 8.5% | 4% | 10.0% |

87. The credit conversion factor for risk positions from debt instruments are as follows:

- 0.6 percent for risk positions from a debt instrument or reference debt instrument of high specific risk.
- 0.3 percent for risk position from a reference debt instrument that underlies a credit default swap and that is of low specific risk.
- 0.2 percent otherwise.

88. Underlying instruments of OTC derivatives that are not in any of the categories above are assigned to separate individual hedging sets for each category of underlying instrument. A credit conversion factor of 10 percent is applied to the notional equivalent amount.

89. There may be transactions with a non-linear risk profile for which the bank cannot determine the delta with a model that the supervisor has approved for the purposes for determining the minimum capital requirements for market risk (instrument models approved for the purposes of the standardised approach for market risk, or instrument models approved as part of the firm's admission to the internal modelling approach for market risk). In the case of payment legs and transactions with debt instruments as underlying, there may be transactions for which the bank cannot determine the modified duration with such a model. For these transactions, the supervisor will determine the size of the risk positions and the applicable credit conversion factors conservatively. Alternatively, supervisors may require the use of the current exposure method. Netting will not be recognised: in other words, the exposure amount or EAD is to be determined as if there were a netting set that comprises just the individual transaction.

90. The supervisory scaling parameter $\beta$ (beta) is set at 1.4.

## VII. Current Exposure Method

91. Banks that do not have approval to apply the internal models method may use the current exposure method as identified in paragraphs 186, 187 and 317 of this Framework. The current exposure method is to be applied to OTC derivatives only; SFTs are subject to the treatments set out under the Internal Model Method of this Annex or under the Part 2, Section II.D, of this Framework.

92. (Deleted)

92(i) Under the Current Exposure Method, banks must calculate the current replacement cost by marking contracts to market, thus capturing the current exposure without any need for estimation, and then adding a factor (the "add-on") to reflect the potential future exposure over the remaining life of the contract. It has been agreed that, in order to calculate the credit equivalent amount of these instruments under this current exposure method, a bank would sum:

- The total replacement cost (obtained by "marking to market") of all its contracts with positive value; and
- An amount for potential future credit exposure calculated on the basis of the total notional principal amount of its book, split by residual maturity as follows:

| | Interest Rates | FX and Gold | Equities | Precious Metals Except Gold | Other Commodities |
|---|---|---|---|---|---|
| One year or less | 0.0% | 1.0% | 6.0% | 7.0% | 10.0% |
| Over one year to five years | 0.5% | 5.0% | 8.0% | 7.0% | 12.0% |
| Over five years | 1.5% | 7.5% | 10.0% | 8.0% | 15.0% |

Notes:

1. For contracts with multiple exchanges of principal, the factors are to be multiplied by the number of remaining payments in the contract.

2. For contracts that are structured to settle outstanding exposure following specified payment dates and where the terms are reset such that the market value of the contract is zero on these specified dates, the residual maturity would be set equal to the time until the next reset date. In the case of interest rate contracts with remaining maturities of more than one year that meet the above criteria, the add-on factor is subject to a floor of 0.5%.

3. Forwards, swaps, purchased options and similar derivative contracts not covered by any of the columns of this matrix are to be treated as "other commodities".

4. No potential future credit exposure would be calculated for single currency floating/floating interest rate swaps; the credit exposure on these contracts would be evaluated solely on the basis of their mark-to-market value.

92(ii). Supervisors will take care to ensure that the add-ons are based on effective rather than apparent notional amounts. In the event that the stated notional amount is leveraged or enhanced by the structure of the transaction, banks must use the effective notional amount when determining potential future exposure.

93. Banks can obtain capital relief for collateral as defined in paragraphs 146 and 703 of this Framework. The methodology for the recognition of eligible collateral follows that of the applicable approach for credit risk.

94. The counterparty credit risk exposure amount or EAD for single name credit derivative transactions in the trading book will be calculated using the potential future exposure add-on factors set out in paragraph 707 of this Framework.

95. To determine capital requirements for hedged banking book exposures, the treatment for credit derivatives in this Framework applies to qualifying credit derivative instruments.

96. Where a credit derivative is an $n^{th}$-to-default transaction (such as a first-to-default transaction), the treatment specified in paragraph 708 of this Framework applies.

*Bilateral netting*

96(i). Careful consideration has been given to the issue of **bilateral netting**, i.e. weighting the net rather than the gross claims with the same counterparties arising out of the full range of forwards, swaps, options and similar derivative contracts.[248] The Committee is concerned that if a liquidator of a failed counterparty has (or may have) the right to unbundle netted contracts, demanding performance on those contracts favourable to the failed counterparty and defaulting on unfavourable contracts, there is no reduction in counterparty risk.

96(ii). Accordingly, it has been agreed for capital adequacy purposes that:

(a) Banks may net transactions subject to novation under which any obligation between a bank and its counterparty to deliver a given currency on a given value date is automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single amount for the previous gross obligations.

(b) Banks may also net transactions subject to any legally valid form of bilateral netting not covered in (a), including other forms of novation.

(c) In both cases (a) and (b), a bank will need to satisfy its national supervisor that it has:[249]

(i) A netting contract or agreement with the counterparty which creates a single legal obligation, covering all included transactions, such that the bank would have either a claim to receive or obligation to pay only the net sum of the positive and negative mark-to-market values of included individual transactions in the event a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances;

(ii) Written and reasoned legal opinions that, in the event of a legal challenge, the relevant courts and administrative authorities would find the bank's exposure to be such a net amount under:

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[248] Payments netting, which is designed to reduce the operational costs of daily settlements, will not be recognised in the capital framework since the counterparty's gross obligations are not in any way affected.

[249] In cases where an agreement as described in 96(ii) (a) has been recognised prior to July 1994, the supervisor will determine whether any additional steps are necessary to satisfy itself that the agreement meets the requirements set out below.

- The law of the jurisdiction in which the counterparty is chartered and, if the foreign branch of a counterparty is involved, then also under the law of the jurisdiction in which the branch is located;
- The law that governs the individual transactions; and
- The law that governs any contract or agreement necessary to effect the netting.

The national supervisor, after consultation when necessary with other relevant supervisors, must be satisfied that the netting is enforceable under the laws of each of the relevant jurisdictions;[250]

(iii) Procedures in place to ensure that the legal characteristics of netting arrangements are kept under review in the light of possible changes in relevant law.

96(iii). Contracts containing walkaway clauses will not be eligible for netting for the purpose of calculating capital requirements pursuant to this Framework. A walkaway clause is a provision which permits a non-defaulting counterparty to make only limited payments, or no payment at all, to the estate of a defaulter, even if the defaulter is a net creditor.

96(iv). Credit exposure on bilaterally netted forward transactions will be calculated as the sum of the net mark-to-market replacement cost, if positive, plus an add-on based on the notional underlying principal. The add-on for netted transactions ($A_{Net}$) will equal the weighted average of the gross add-on ($A_{Gross}$)[251] and the gross add-on adjusted by the ratio of net current replacement cost to gross current replacement cost (NGR). This is expressed through the following formula:

$$A_{Net}=0.4*A_{Gross}+0.6*NGR*A_{Gross}$$

where :

NGR=level of net replacement cost/level of gross replaceent cost for transactions subject to legally enforceable netting agreements[252]

96(v). The scale of the gross add-ons to apply in this formula will be the same as those for non-netted transactions as set out in paragraphs 91 to 96 of this Annex. The Committee will

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[250] Thus, if any of these supervisors is dissatisfied about enforceability under its laws, the netting contract or agreement will not meet this condition and neither counterparty could obtain supervisory benefit.

[251] $A_{Gross}$ equals the sum of individual add-on amounts (calculated by multiplying the notional principal amount by the appropriate add-on factors set out in paragraph 92(i) of this Annex) of all transactions subject to legally enforceable netting agreements with one counterparty.

[252] National authorities may permit a choice of calculating the NGR on a counterparty by counterparty or on an aggregate basis for all transactions subject to legally enforceable netting agreements. If supervisors permit a choice of methods, the method chosen by an institution is to be used consistently. Under the aggregate approach, net negative current exposures to individual counterparties cannot be used to offset net positive current exposures to others, i.e. for each counterparty the net current exposure used in calculating the NGR is the maximum of the net replacement cost or zero. Note that under the aggregate approach, the NGR is to be applied individually to each legally enforceable netting agreement so that the credit equivalent amount will be assigned to the appropriate counterparty risk weight category.

continue to review the scale of add-ons to make sure they are appropriate. For purposes of calculating potential future credit exposure to a netting counterparty for forward foreign exchange contracts and other similar contracts in which notional principal is equivalent to cash flows, notional principal is defined as the net receipts falling due on each value date in each currency. The reason for this is that offsetting contracts in the same currency maturing on the same date will have lower potential future exposure as well as lower current exposure.

*Risk weighting*

96(vi). Once the bank has calculated the credit equivalent amounts they are to be **weighted** according to the category of counterparty in the same way as in the main framework, including concessionary weighting in respect of exposures backed by eligible guarantees and collateral. The Committee will keep a close eye on the credit quality of participants in these markets and reserves the right to raise the weights if average credit quality deteriorates or if loss experience increases.