

**INTERPRETATION OF THE CAPITAL ACCORD  
FOR THE MULTILATERAL NETTING OF  
FORWARD VALUE FOREIGN EXCHANGE TRANSACTIONS  
(April 1996)**

This document presents the Basle Committee's interpretation of the Capital Accord for a bank that participates in a multilateral netting arrangement for foreign exchange contracts. Consistent with the framework of the Capital Accord, the interpretation focuses only on forward replacement risk, the potential cost of replacing the cash flows on outstanding contracts in the case of counterparty default, and not on settlement risk.

The Basle Capital Accord sets forth capital requirements for banks' off-balance-sheet activities (forwards, swaps, purchased options and similar derivative contracts). The Accord was recently amended to recognise the benefits of legally enforceable bilateral netting agreements for capital purposes, both for the calculation of a bank's current exposure and its potential future exposure. Off-balance-sheet contracts traded on exchanges are excluded from the framework of the Accord, provided that they are subject to daily receipt and payment of cash variation margin.

In recent years, there have been industry initiatives to extend the benefits of netting beyond bilateral netting to multilateral netting, covering contracts which originate within a group of counterparties.<sup>1</sup> This is achieved in practice by netting through a central clearing house all transactions that originate bilaterally between the participating counterparties. The legal techniques for achieving this netting may vary, but the result is that for every eligible transaction agreed by a pair of participants, the clearing house would be interposed as the contractual legal counterparty to each participant.

Unlike the existing exchanges that are exempt from the capital requirements of the Accord, the emerging multilateral netting systems addressed here do not provide for daily receipt and payment of cash variation margin. As a result, the exposure of a participant to the multilateral netting arrangement can build up over time. In the event of a default by one or more of the clearing house participants, the surviving participants could face significant losses (the case where the defaulting member fully collateralises the exposure it presents to the clearing house is discussed in Section IV below).

Given this difference to the exchanges that qualify for an exemption under the Capital Accord, there is a need for near-term guidance as to how a bank participating in a multilateral netting arrangement for forward value contracts should apply the risk-based

---

<sup>1</sup> The first foreign exchange multilateral netting scheme to begin operations is the London-based Exchange Clearing House, Ltd. (ECHO). Another system under development is the New York-based Multinet. Both schemes focus on the multilateral netting and settlement of spot and forward foreign exchange transactions.

capital framework. The approach outlined in this document provides a relatively simple interpretation of the existing Capital Accord for establishing the capital requirement in relation to the risk faced by a participant in such a multilateral netting arrangement. Over the longer-term, a more comprehensive review of the risks inherent in multilateral netting systems and other types of exchanges and clearing houses could lead to a formal amendment of the Capital Accord.

As background, the following section discusses the treatment of off-balance-sheet contracts under the Accord, including recent amendments to recognise bilateral netting in the calculation of both current and potential future credit exposure. Section II presents the Committee's interpretation of the Capital Accord for banks that participate in multilateral netting systems for foreign exchange contracts. Section III discusses the risk-weighting of a participant's credit exposure. Section IV addresses the treatment of collateral in the multilateral netting environment. Section V discusses the potential risk arising from the simultaneous default of two or more participants of the multilateral netting system. The final section considers the risk of a default by the clearing house itself.

## **I. Background**

Under the existing risk-based capital framework, off-balance-sheet contracts are converted into credit equivalent amounts and then risk-weighted according to the identity of the obligor or counterparty. If a guarantee is associated with the transaction or if qualifying collateral has been posted (that is, generally, cash or OECD government securities), the portion of the credit equivalent amount that is covered by the guarantee or collateral may be risk-weighted according to the guarantor or the nature of the collateral.

The Basle Accord excludes exchange-traded derivative contracts from the risk-based capital framework where these contracts are subject to daily receipt and payment of cash variation margin (referred to as two-way margining) that has the effect of reducing a contract's current exposure to zero.<sup>2</sup> Over-the-counter derivative contracts, however, are assessed a capital charge based on the current market value (current exposure) of each contract and an estimate of additional credit exposure (referred to as the add-on for potential future exposure) that may arise as a result of fluctuations in prices or rates. The maximum risk weight for derivative contracts is 50%.

The current exposure of a derivative contract is the market value of the contract if that value is positive, or zero if the market value is zero or negative. The add-on for potential future exposure is estimated by multiplying the notional principal amount of the contract by a credit conversion factor that is determined by the remaining maturity and type of contract.

---

<sup>2</sup> While exchange-traded positions are excluded from capital requirements, claims directly on exchange clearing houses are risk-weighted, as are the gross obligations arising from contracts traded on exchanges where there is no daily payment and receipt of cash variation margin.

Under the original Accord, each derivative contract entered into by an institution was converted into a credit equivalent amount. Institutions generally were not permitted to offset positive and negative market values of multiple contracts with a single counterparty.<sup>3</sup> In July 1994, the Basle Accord was revised to recognise legally sound bilateral netting arrangements. Under the revision, institutions with such netting arrangements may offset positive and negative market values to calculate a single net current exposure for all transactions covered by the netting agreement (subject to a minimum value of zero).

Another revision to the Accord, effective as of year-end 1995, permits institutions with qualifying bilateral netting arrangements to reduce their add-on amount through application of a formula designed to recognise reductions in the volatility of current exposures resulting from netting arrangements. The formula is expressed as

$$A_{\text{net}} = 0.4(A_{\text{gross}}) + 0.6(\text{NGR} \times A_{\text{gross}})$$

where  $A_{\text{net}}$  is the adjusted add-on for all contracts subject to the bilateral netting contract,  $A_{\text{gross}}$  is the sum of the gross add-ons for the contracts covered by the netting agreement, and NGR is the ratio of the net current exposure of the contracts included in the bilateral netting arrangement to the gross current exposure of those same contracts.

## **II. Treatment of multilateral netting under the Capital Accord**

This section presents the Committee's interpretation of the existing Capital Accord for a bank participating in a multilateral netting system for forward value contracts. The Committee's approach builds upon the belief that a well-constructed multilateral netting system can reduce forward credit exposure for its participants. It also assumes that the multilateral system has received approval from the relevant authority responsible for its oversight, and that it therefore satisfies certain standards concerning, at a minimum, the legal soundness of the netting arrangement, the sound design and operation of the system, the sufficiency of liquidity arrangements, and the mechanisms for managing collateral. These standards are defined primarily by the legal and payment systems experts of the host authorities together with the authorities responsible for the supervision of the participants in the netting arrangements.

### **(1) Current exposure**

While each contract in the multilateral netting arrangement shows the clearing house and one of the participants as the legal counterparties, this does not mean that the forward credit risk of a participant should be measured in terms of its net bilateral claim on

---

<sup>3</sup> With the exception of netting by novation.

the clearing house.<sup>4</sup> The primary risk of loss for a participant arises from the possibility of another participant's default, not from a default by the clearing house itself (the risk of default by the clearing house itself is considered in Section VI below). Depending on the structure of the clearing system, participants may be responsible for satisfying claims of other participants in the event a participant defaults, according to the system's pre-established loss-allocation rules. The clearing house would, on a daily basis, determine the loss it would incur if a participant failed, allocate that loss among the surviving participants according to the pre-established loss-allocation formula, and notify each participant of its exposure vis-à-vis every other participant in the system (referred to as the primary loss allocation).

Consequently, a participant's capital requirement for current credit exposure is best determined on the basis of the primary loss allocations of the clearing house (that is, the participant's pro rata share of the clearing house exposure). Since a defaulter cannot be identified in advance, a participant's total net current exposure is the sum of the primary loss allocations it could be required to absorb from a default by every other participant, individually, in the clearing system. The following example shows how the current exposure amount based on primary loss allocations could be determined for a simple clearing house structure (other types of loss allocation rules are also possible).

**Table 1**  
**Net replacement values**

Position of	With respect to:				
	A	B	C	D	Clearing house
A	x	-250	50	0	-200
B	250	x	-100	-400	-250
C	-50	100	x	500	550
D	0	400	-500	x	-100

Table 1 shows that participant B owes the clearing house the net amount of \$250. If participant B were to default, the clearing house would experience a loss of \$250. The clearing house would allocate this loss to survivors C and D since they have bilateral net claims on participant B in the amounts of \$100 and \$400, respectively. C and D's total bilateral claims amount to \$500, of which C is owed 20% and D 80%.

Thus, as indicated in Table 2, C's primary loss allocation vis-à-vis B would be \$50 (20% of 250) and D's primary loss allocation would be \$200 (80% of 250). The sum of the

<sup>4</sup> The approach taken here focuses on how best to capture the economic effects of multilateral netting through capital requirements for a participant in such a scheme.

primary loss allocations for participant A, and thus its current credit exposure, would be zero. Similarly, the current credit exposure would be 200 for participant B, 150 for participant C, and 200 for participant D.

**Table 2**  
**PRIMARY LOSS ALLOCATIONS**

Default of	Loss allocation to:				
	Total	A	B	C	D
A	200	x	200 (100%)	0	0
B	250	0	x	50 (20%)	200 (80%)
C	0	0	0	x	0
D	100	0	0	100 (100%)	x
Total	550	0	200	150	200

This example also illustrates that current exposure can be understated significantly when it is based on the net bilateral exposure of a participant vis-à-vis the clearing house. Table 1 shows that participant D's net bilateral exposure to the clearing house is zero (market value is -100) but its loss allocation exposure, and therefore real credit risk, is 200 (Table 2).

## (2) Potential future exposure

The capital charge for the potential future exposure of a bank participating in a multilateral netting arrangement for forward value contracts would continue to be calculated on the basis of the notional bilateral relationships with each of the other clearing house participants. That is, the add-on under multilateral netting would be calculated as if netting occurred bilaterally with the same set of counterparties, applying the bilateral netting formula:

$$A_{\text{net}} = 0.4 * A_{\text{gross}} + 0.6 * \text{NGR} * A_{\text{gross}}$$

The  $A_{\text{nets}}$  with respect to each of the bilateral counterparties of the reporting bank would be summed to arrive at the total add-on for potential future exposure for the reporting bank. Consequently, a participant and/or the clearing house would have to keep track of its gross potential future exposure, gross current exposure, and bilaterally-netted current exposure to each of the other participants in the multilateral system.

The approach taken by the Committee is relatively conservative and pragmatic, reflecting the difficulties of approximating a multilateral netting participant's potential future exposure. In contrast to bilateral netting, where potential future exposure is a function of the volatility of the contracts between two counterparties, a multilateral netting participant's

potential exposure can depend on the transactions across all participants of the clearing house, as well as on the arrangements for sharing losses should a participant default. The Committee would welcome empirical or theoretical analysis by the industry on the volatility of current exposure under multilateral netting as compared with the volatility of current exposure under bilateral netting for the same set of contracts and counterparties (whereby the multilaterally netted current exposure of a participant is defined as the sum of the primary loss allocation amounts).

The Committee has considered the question of whether to allow a multilateral netting clearing house to use its own simulations as a basis for setting the capital requirement for potential future exposure. It concluded that this issue requires further study. Moreover, it is of the view that the question of whether to allow simulations also extends to the non-netting and bilateral netting environment and therefore needs to be considered in a broader context.

### **III. Risk weight**

For a given participant, each primary loss allocation amount would be added to the corresponding add-on for potential future exposure to arrive at a total credit equivalent amount with respect to each of the other participants in the clearing house. These credit equivalent amounts would then be assigned to the appropriate risk category according to the identity of the other participants (most likely 20%) or the nature of the collateral (zero percent). (See collateral discussion below.)

### **IV. Collateral**

Under the Capital Accord, a bank may assign the portion of a claim or credit equivalent amount collateralised by cash or OECD government securities to the zero percent risk category. Likewise, a participant in a multilateral netting arrangement would be able to assign the portion of its credit equivalent amount that is supported by collateral to the zero percent risk category. However, for multilateral systems where all participants post collateral in a pool, the reporting bank must be able to determine what portion, or percentage, of the collateral pool it would have a claim on in the event another participant defaulted. In other words, the bank must be able to identify the extent to which collateral is available to cover its credit exposure. If collateral has been posted by all banks participating in the multilateral system, but the reporting bank cannot identify what percentage of the collateral, if any, it would be entitled to recover to satisfy its losses, the reporting bank would not be able to determine what portion of its credit equivalent amount is covered by collateral. Accordingly, it would be problematic to permit a reduced risk-weight for an unidentifiable portion of a credit equivalent amount.

Against this background, the following guidelines will be applied when assessing the extent to which collateral may be taken into account:

**(1) Current exposure**

Under a partially or fully-collateralised system, members must cover part or all of the exposure, respectively, they present to the clearing house through collateral. This collateral pool in turn reduces the loss amount that the clearing house would allocate to the survivors, thus lowering a participant's current exposure in the same proportion. For a supervisor to recognise a corresponding reduction in current exposure for a clearing house participant, the following additional criteria would have to be met:

- the collateral carries a zero percent risk weight under the Capital Accord;
- the collateral is only available to cover forward replacement risk (and not, for example, settlement risk);
- a participant can determine how much of the collateral pool posted with the clearing house is available to reduce current exposure.

To the extent that participants fully collateralise the exposure they present to the clearing house and all of the above criteria are met, then participants could risk weight the current exposure portion of the credit equivalent amounts at zero percent.

**(2) Potential future exposure**

If all participants *fully collateralise* on a daily basis the exposure they present to the clearing house, the calculation for potential future credit exposure could be waived, provided that a number of conditions, in addition to those presented in (1) above, are met. In particular, the market value of the collateral held by the clearing house must be sufficient to cover potential increases in its exposure to each of the participants on an ongoing basis and at a high level of probability. The market value of the collateral would also have to be sufficient to cover a build-up of potential losses to the clearing house resulting from the inability to quickly replace or close out the positions of a defaulting participant. In addition, the collateral would have to cover potential losses over a sufficiently long holding period to account for the settlement cycle associated with the receipt of collateral (i.e., in certain cases it may take more than one day for collateral to be posted). These criteria may require the application of a holding period of a number of days. Moreover, the adequacy of the amount of collateral posted needs to be reviewed, and if necessary, adjusted on at least a daily basis.

The appropriate treatment of potential future exposure under a *partially-collateralised system* is more complex and depends on the specific nature of the collateral scheme of the clearing house. In general, however, the criteria of the previous paragraph would be applied to that portion of potential future exposure that is covered by collateral.

For example, if participants were required to maintain an *absolute* level of collateral independent of the fluctuation of the exposure that they present to the clearing house, it may be justified to provide for a reduction in current exposure but to maintain the

full capital charge for potential future exposure. On the other hand, if a participant's exposure to the clearing house is subject to a fixed limit (e.g. a net debit cap) and the absolute level of collateral is equal to or greater than this limit, then the capital charge for potential future exposure could be waived.

Another possibility is that the clearing house requires participants to maintain collateral in a fixed *proportion* to the exposure that they present to the clearing house. In this case a reduction in the capital requirement for potential future exposure proportional to the level of collateralisation may be justified, subject to satisfaction of the other criteria discussed in this section.

## **V. Second round effects**

In the absence of full collateralisation of the exposure that participants present to the clearing house, the default of one participant could trigger the default of one or more other participants, propagated through the loss allocation mechanism of the clearing house. In addition, it is possible that two or more independent defaults occur simultaneously.

In the bilateral netting environment, the loss to a participant that results from the default of two or more of its counterparties equals the sum of its bilateral exposures to both and the amount of capital set aside to support such losses is proportional to this sum. In the multilateral netting case, however, the loss to a participant as a result of the default of two or more of the other clearing house participants could exceed the sum of the corresponding primary loss allocations.

As an interim solution, the Committee believes that the relatively conservative treatment of potential future exposure described above may provide, at least to some extent, a cushion for the risk of second round defaults. However, more work needs to be carried out in the future to better understand this type of risk, which might have to be addressed separately through an additional capital charge. The Committee invites comment on the nature of second round default risk and on possible methodologies for capturing this risk under the framework of the Accord.

## **VI. Default of the clearing house**

The Committee also considered the possibility of a default by the clearing house itself, e.g., that the clearing house is not able to meet a participant's net claims or the clearing house loses some or all of the collateral that an out-of-the-money participant has posted. Generally, this type of exposure may be associated with operational risks, mismanagement, or fraud. Setting specific capital requirements for these contingencies would be inconsistent with the Capital Accord, which does not address these risks in a non-multilateral setting. These risks should be addressed through the process of approval and oversight of the multilateral netting scheme and through the ongoing adherence to sound risk management practices.



However, the Committee has considered the potential treatment of: (1) a clearing house structure that neither collateralises the exposure that its members present nor allocates the losses back to the surviving members, and, (2) a clearing house that allocates only a part of the losses (taking into account any collateral arrangements) to the surviving members. The capital charge for a participant in such clearing houses could continue to be assessed bilaterally with respect to each of the other participants, it could be calculated as a participant's net exposure to the clearing house, or it could be calculated as a combination of the net bilateral exposures to the other participants and the clearing house. The Committee notes that further consideration would be necessary concerning the treatment of such structures for capital adequacy purposes, should they arise in the future.

