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another and it would be advisable if the implications of so doing were appreciated.

Second, it should be apparent from the above spate of cases that the law governing letter of credit obligations and other forms of payment undertaking is in a state of flux, in particular owing to the introduction to English law of the Contracts (Applicable Law) Act 1990. Moreover, the proposition that the proper law of each contract to a letter of credit transaction should be considered in its specific context and that the law of one contract will not necessarily be the law of another is coming under some strain as demonstrated by *Bank of Baroda v Vysya Bank* where policy factors resulted in an issuing bank's credit obligation being deemed to be governed by the same law as the confirming bank's payment obligation. One practical and sensible step which banks may take to avoid being drawn into litigation over governing law is expressly to provide in their credits, other payment undertakings and connected contracts that a particular law is to govern the relevant contract. A growing number of banks are doing just this.

Basic Elements in the Maze of Netting

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Netting has become a fashionable word in financial circles. However, although there is an abundant specialised literature, the man in the street of the financial world might find himself at a loss because the cardinal points of netting could be easily missed. The aim of this article is to give the simplest but essential framework to netting.

The aim of this analysis is large: to describe in simple legal terms the maze of netting.[1] Many people involved in the financial business have heard of netting, but, apart from expert lawyers, few can move easily in this field. There is much specialised literature analysing the ins and outs of netting, describing sophisticated interpretations, studying the jurisprudence and so on. Many concepts such as set-off, netting of payment, netting of obligations, netting by novation and close-out netting are taken for granted and several standard contracts contain netting clauses (for example, ISDA, ICOM and IFEMA) which overlap.

The aim of this analysis is to give a simple outline to netting. Obviously it will not be exhaustive, but it is intended to be rigorous.

First of all, why is netting so important? The answer is: it can reduce risks.

In order to understand this, the risks need to be defined. Then one can approach the definitions of the terms used to describe different forms of netting and their impact on risks. Finally, brief mention will be made of which kinds of netting are contained in the major standard agreements adopted by market participants.

The content of this analysis has been the subject of a lecture given in Tokyo on 2 March 1994 under the aegis of the Institute of Foreign Bankers.

1. The essential literature on netting is: Bank of International Settlement ('BIS'), 'Interbank Netting Schemes' (the so-called Angell Report), Basle, February 1989; BIS, 'Interbank Netting Schemes – Report of the Committee on The Interbank Netting Schemes of the Central Banks of the Group of Ten Countries' (the so-called Lamfalussy Report), Basle, November 1990; BIS, 'The Prudential Supervision of Netting, Market Risk and Interest Rate Risk', Basle, April 1993; BIS, 'The Supervisory Recognition of Netting for Capital Adequacy Purposes', Basle, April 1993.

Definition of Risks

There are several kinds of risks in the financial market and each transaction normally carries various kind of risks. The most common risks are defined below. There are no official definitions, but there is a general understanding of the meaning of each risk.

Credit risk is the risk that a counterparty will not meet an obligation when due and will never be able to meet that obligation for full value due to its insolvency.

Liquidity risk is the risk that clearing, or settlement, payments will not be made when due, even though one or more counterparties have sufficient assets and net worth ultimately to make them. For example, there may be a temporary inability to convert assets to cash or operational difficulties of various kinds or there may be an inability of correspondents to perform settlement functions which will create liquidity problems.

Systemic risk is the risk that the inability of one participant in a payment system, or in the financial markets, to meet obligations when due will cause other participants to fail to meet their obligations when due.

Sovereign risk is the risk that a solvent counterparty cannot meet an obligation as it falls due, as the result of an *actum principis* such as a unilateral suspension of payments imposed by a government, the currency becoming invalid or not transferable, and so on. It reflects the financial situation of the country in which the counterparty is based and the stability of the currency due by the counterparty. It is also linked to the political stability of the country where the counterparty is based and of the country that has issued the currency due by the counterparty.

Delivery risk exists when the counterparties have *reciprocal* delivery obligations to be performed

simultaneously and is the risk that a counterparty will not meet its delivery while receiving the delivery from the other counterparty. Transactions which incur such risk include foreign exchange trades and (with some major exceptions) bond purchases.

Finally, *market risk* is the risk that reflects the relation between the market liquidity and the maturity date of an obligation. In other words, the longer the maturity of the transaction, the lower the liquidity and the higher volatility and sensitivity to rate variations becomes, therefore the higher the market risk.

Definition of Netting Terms[2]

Set-off, or the right of set-off, is the right to compensate a payment due with a payment to be received. The right of set-off can have different sources, for example, the civil code/law or a contract between parties.

Netting is the process by which the obligations from, and the obligations to, a specific counterparty may be set off against each other.

Netting of payment is the process by which two parties arrange informally to make one net payment between themselves, for a currency and on the same date on which several amounts are due. Because there is no change in their contractual obligations, the credit risks between the parties are unchanged, and they remain legally obligated for the gross amounts of their transactions. However, a significant commercial benefit is that this does reduce the number of settlement messages and the amount of funds needed for the routine settlement of transactions between the parties.

Two banks may enter into a formal agreement to accept a single net amount, to or from one another, in discharge of those payment obligations. This can be termed legally 'binding payments netting'. Again, this type of netting does not directly effect a discharge of the underlying foreign exchange contracts or other obligations which have generated the payments being netted, and the parties remain obligated to settle the gross amounts of these obligations.

In case of bankruptcy before the netting date, there is no difference in practice between the two types of netting of payment described above. However, if a counterparty is declared bankrupt *after* the netting date, *and* netting did not take place, the amount due from the bankrupt party's estate in the first case will be the gross (non-netted) amount, while in the second case it will be the netted amount.

A typical example of netting of payment is two forward foreign exchange transactions maturing on the same date with at least one common currency to be delivered and received by both parties: the obligations remain in full force until maturity, when the common currency payments are compensated.

Netting of obligations is the process by which the obligations from and to counterparties under a series of underlying transactions are set off against each other. This can be achieved mainly by novation and close-out netting.

Netting by novation is a process by which each new deal is merged with previous ones, so that at any given time there is only one contract outstanding and all the relevant cash flows are netted off. It is a means of reducing counterparty credit risk by effecting a discharge of each individual foreign exchange contract, or other obligation, as it is netted.

This novation process may take place automatically within the trading date, on the exchange of confirmations between the two banks; the bilateral agreement can provide that at the instant the confirmations are matched, previous contracts shall have been satisfied by means of the novations process and are therefore extinguished and replaced by the novated contract. This process can be repeated an infinite number of times until the cut-off time for a particular settlement date. Then settlement instructions, for the final net amounts, are sent to the participants' correspondent banks in the countries of the currencies concerned..

A typical example of netting by novation is two forward foreign exchange transactions maturing on the same date with one common currency to be delivered and received by both parties; the obligations to pay the common currency are satisfied and no payment is due on the maturity date, except when there is a difference between the gross amounts, in which case only one party owes the difference to the other party.

The obvious limitation of netting by novation is that the obligations to deliver the other currencies of the foreign exchange transactions remain in full force. In other words, the effects are limited to obligations in the same currency and on the same date.

Close-out netting in contrast is related to the treatment of future obligations between two banks when a defined event of default, such as the appointment of a receiver or liquidator, occurs. Two banks can enter into a formal bilateral agreement stipulating that if a close-out event occurs the present value of all future amounts due between them will be calculated to provide amounts due that day, and then be recalculated into a base currency to produce one single payment due to or from the closed bank, which the receiver or liquidator is obliged to honour, so as to satisfy all the outstanding obligations between the two banks.

Close-out can apply either to gross liabilities and arising under the original contracts between the two banks, or to their novated net liabilities and claims, in the event that they both also participate in the agreement to net by novations. Close-out provisions

2. Ample use has been made of the definitions given in the Angell Report, Note 1 above, to which the reader is referred for an exhaustive analysis.

can be found in both bilateral and multilateral netting arrangements.

In summary then: the difference between netting by novation and close-out netting is that *the former operates automatically wherever reciprocal obligations (for that specific currency and specific value date) are created, while the latter operates only on the occurrence of an event of default.*

The obvious advantage of close-out netting is that all obligations are: (1) terminated early regardless of their maturities and their currencies and (2) netted. Netting by novation has an advantage in that it has positive capital adequacy implications, whereas close-out netting is not yet generally recognised. Close-out netting is, however, significantly easier and cheaper to administer and under the recent Bank of International Settlement ('BIS') proposals[3] will be allowed for capital adequacy purposes subject to certain restrictions.

Bilateral netting is a form of netting of payment or netting of obligations (by novation and/or close-out) binding between two parties.

Multilateral netting is a form of netting of payment or netting of obligations (by novation and/or close-out) binding among more than two parties. The most common forms of multilateral netting are the following:

(1) *Multilateral netting of payment* is typically found in a multilateral system, with special communications and accounting arrangements.

'Clearing accounts' may be provided to participants by a clearing or settlement agent, who may hold balances for or provide credit to the participants, in order to facilitate settlements.

The employment of a single central clearing account is also a logical possibility, as are other arrangements for accommodating settlements. The essence of multilateral netting is that net amounts due to or due from each participant *vis-à-vis* the clearing group as a whole, for the value on a given day are calculated and then settled by transfers of monetary balances from net debtors to net creditors. However, as in the bilateral case, the settlement liability of participants is not limited to net amounts when the group undertakes multilateral netting of payment.

In the case of multilateral netting of payment, all gross financial obligations (such as foreign exchange contracts) or payment instructions remain outstanding until settlement is final. The Bank of Japan payment system ('BOJ Net') may be considered an example.

(2) *Multilateral netting by novation and substitution* is best described by the example of what could be provided by a foreign exchange clearing house or clearing corporation. National clearing houses might be established which would permit participants to achieve a legally effective multilateral netting of all their foreign exchange contracts with other participants.

3. BIS, 'The Supervisory Recognition of Netting for Capital Adequacy Purposes', Basle, April 1993.

For a contract submitted by a pair of participants, the clearing house would be substituted as the counterparty to each, and the obligations between the participants would be discharged. Further, the clearing house would maintain a running novated net position for relevant currencies and value dates *vis-à-vis* each participant.

This process would result, for a given set of contracts to be netted, in a pattern of net amounts due to the clearing house from each participant, or vice versa, that are equivalent to the multilateral net position of each participant *vis-à-vis* the netting group as a whole.

The clearing house, as a central counterparty, would explicitly take both credit and liquidity risk. At the same time, members would have counterparty credit and liquidity risk with respect to the clearing house, not their trade counterparties. Thus the clearing house would have to manage its credit exposure to each participating counterparty, as well as liquidity risks associated with settlements.

To facilitate risk management, the obligations of individual participants might be collateralised, so that the clearing house might be able to reject contracts submitted for netting if insufficient collateral had been posted.

Margin calls could also be a possibility. The size of collateral requirements and the basis for their calculation across currencies, the sharing of risks in the event defaults exceed posted collateral and the eligibility criteria for collateral would all need to be determined.

Impact on Risks of Various Kinds of Netting

The following conclusions can be drawn regarding the effects of the various kinds of netting on risks.

Netting of payment reduces the delivery risk and the systemic risk since the number and volume of payments are reduced. There is no impact on the credit risk, sovereign risk and market risk since the obligations of the parties remain unchanged. However, in the case of binding netting of payment, the credit risk may be reduced if the netting has *not* taken place *and* the insolvency of one party is declared after the date on which the netting should have taken place.

Among the netting of obligations options, the netting by novation achieves the greatest reduction of delivery risk and systemic risk since the number and volume of payments are reduced. In addition, credit, sovereign and market risks are reduced since the original obligation to pay a certain amount is novated by a new obligation for a reduced amount (resulting from the netting of the original obligation and a supervenient obligation of opposite sign).

The common limitation of netting of payment and netting by novation is that they operate only for

Table 1: Four Major Standard Agreements

	Products	Netting of payment	Netting by novation	Close-out netting	Multilateral netting
ISDA	all derivatives	yes	no	yes	no
ICOM	currency options	yes	no	yes	no
IFEMA	foreign exchange	yes	yes	yes	no
ECHO	foreign exchange	yes	yes	yes	yes

payments or obligations due on the same date and denominated in the same currency.

Close-out netting achieves a much bigger reduction of credit risk since it affects all obligations regardless of their due date and currency. However, since it is triggered by certain events related mainly to the insolvency of the counterparty, there is no reduction of the delivery and systemic risks. The combination of netting by novation and close-out netting represents the greatest reduction of risks among the bilateral nettings.

The reduction of delivery and credit risks is by far the most impressive with multilateral netting by novation and substitution, since the number and volume of payments are reduced in a much larger scale compared to bilateral nettings, and the credit risk is significantly reduced in terms of amounts and in terms of creditworthiness of the counterparty (clearing house).[4]

As a consequence of the risk reduction achievable with the various kinds of netting, the capital adequacy requirements in certain cases become lighter, implying a lower cost in terms of capital allocation.[5]

Netting in the Major Standard Agreements

The master agreements most commonly used in the financial market contain some forms of netting. Table 1 indicates how the four major standard agreements deal with netting. The agreements considered here are as follows:

ISDA is the master agreement (1992 edition) created by the International Swap Dealers' Association, which covers a wide variety of contracts such as rate swap transaction, basis swap, forward rate transaction, commodity swap, commodity option, equity or index equity option, bond option, interest rate option, foreign exchange transaction, currency option and so on.

ICOM is the master agreement on International Currency Option Market ('ICOM') terms, created under the auspices of the British Bankers' Association, which covers currency options. A revision of the agreement is under way and could modify, among other changes, the netting clauses.

IFEMA is the International Foreign Exchange Master Agreement, created under the aegis of the British Bankers' Association and the New York Foreign Exchange Committee, which covers foreign exchange contracts.

ECHO is the agreement created by the Exchange Clearing House Ltd, London, which established the first multilateral foreign exchange netting system in the world.

4. An example taken from the ECHO material of the effectiveness of multilateral netting compared to bilateral netting is shown here below.

A bank which makes 300 interbank deals a day, involving 24 currencies, would have to make 300 payments and receive 300 payments – a total of 600 entries over the nostro accounts. If all counterparties were users of a multilateral netting by novation and substitution system then the bank would make or receive a maximum of only 24 payments in total – one for each currency involved.

A sample of 80 potential bank counterparties was taken, with which 331 deals were settled. The assumption is that there is little benefit in bilaterally netting fewer than 5 deals with any counterparty. Given this assumption, 188 of 331 deals would have been eligible for bilateral netting. This means that the 188 USD payments or receipts would have netted down to 23. However, the remaining 143 would still have to be settled individually. The total number of payments or receipts using bilateral netting would therefore be 166 (a reduction of 50 per cent). If all the counterparties were in a multilateral clearing house then the number of payments or receipts would have been reduced to only 1 (a reduction of 99 per cent).

Sample size:	*80 counterparties*
Number of USD deals settled (bought or sold):	331
Effect of bilateral netting	
Number of potential bilateral netting counterparties (5 deals or more):	23
Number of deals to be bilaterally netted:	188
Total number of USD payments or receipts:	23+143 = 166
Effect of multilateral netting	
Total number of USD payments or receipts:	1

5. The effectiveness of various kinds of netting for capital adequacy purposes is subordinated to some conditions detailed in the documents mentioned in Note 1.