BANK FOR INTERNATIONAL SETTLEMENTS

OTC DERIVATIVES: SETTLEMENT PROCEDURES AND COUNTERPARTY RISK MANAGEMENT

Report by the Committee on Payment and Settlement Systems and the Euro-currency Standing Committee of the central banks of the Group of Ten countries

Basle

September 1998

The present publication is also available on the BIS World Wide Web site (http://www.bis.org).

ISBN 92-9131-066-2

FOREWORD

In recent years, both the Committee on Payment and Settlement Systems and the Euro-currency Standing Committee have published reports on the implications of the very rapid growth of over-the-counter (OTC) derivatives markets in terms of risks to banks and other counterparties to those transactions and risks to the financial system as a whole. However, none of these reports has provided a comprehensive survey and analysis of the practices and procedures that participants in these markets actually use to manage their counterparty risks. The two Committees jointly organised a study group to fill this gap. This report presents the study group's work.

The study group, chaired by Mr. Patrick Parkinson of the Board of Governors of the Federal Reserve System, was given two specific objectives. First, it was to coordinate a survey of OTC derivatives dealers designed to develop a clear and comprehensive understanding of existing policies and procedures for documenting, processing and settling OTC transactions and for managing the associated counterparty risks. Secondly, it was to identify any weaknesses in practices that appear to exacerbate counterparty risks significantly or even possibly pose risks to the financial system generally, and to consider changes in practices, including new services, that could mitigate those risks.

The study group coordinated interviews with 30 leading dealers in OTC derivatives, including two or more from each of the G-10 countries. Overall, the results of the interviews indicate that practices for processing trades and managing counterparty risks are broadly similar in all the G-10 countries. Standard legal agreements and confirmation templates are used to document most transactions. Transaction processing, from data capture through to confirmation and settlement, is increasingly automated, although the more structured transactions still usually require manual intervention. Netting and, to a growing extent, collateral agreements are used to mitigate counterparty credit risks. Finally, the vast majority of OTC transactions are settled bilaterally between the counterparties, rather than through clearing houses.

A potential weakness in practices that was identified in the interviews was the existence of significant backlogs of unsigned master agreements and outstanding confirmations. The degree to which risks are exacerbated by these practices cannot be reliably assessed on the basis of the interview results. Given the size of some of the reported backlogs, this clearly deserves further attention. The study group recommends that both derivatives counterparties and prudential supervisors review the backlogs, assess the risks entailed and take appropriate steps to ensure that the risks are adequately controlled.

A development that the study group believes could significantly mitigate risks in OTC derivatives transactions is the rapidly expanding use of collateral. However, to ensure that the benefits concerned are realised, counterparties must effectively manage the liquidity, legal, custody and operational risks of using collateral. The study group recommends that counterparties carefully assess these risks and that prudential supervisors consider developing supervisory guidance in this area.

The expansion of clearing houses for OTC derivatives may also reduce counterparty risks. The study group recommends that counterparties assess the benefits of clearing, taking into account the effectiveness of the clearing house's risk management procedures and the effects of clearing on credit risks on uncleared contracts. National authorities should ensure that there are no unnecessary legal or regulatory impediments to clearing and that clearing houses adopt effective risk management safeguards.

The Committees are indebted to Mr. Parkinson for his excellent leadership in chairing the study group. Able assistance in editing and publishing the report was provided by the BIS.

Wendelin Hartmann, Chairman,
Committee on Payment and Settlement Systems
and Member of the Directorate
of the Deutsche Bundesbank

Yutaka Yamaguchi, Chairman,
Euro-currency Standing Committee
and Deputy Governor
of the Bank of Japan

Members of the Study Group on OTC Derivatives

Chairman	Mr. Patrick Parkinson, Board of Governors of the Federal Reserve System
National Bank of Belgium	Mr. Johan Pissens
Bank of Canada	Mr. Fred Daniel
Bank of England	Mr. Ian Tower
Bank of France	Ms. Marie-Sybille Brunet-Jailly Mr. Frédéric Hervo
Deutsche Bundesbank	Mr. Roland Neuschwander
Bank of Italy	Mr. Pietro Stecconi
Bank of Japan	Mr. Haruhiko Saito Mr. Satoshi Kawazoe
Netherlands Bank	Mr. Pim Claassen
Sveriges Riksbank	Mr. Martin Andersson
Swiss National Bank	Mr. Christian Braun
Board of Governors of the Federal Reserve System	Ms. Patricia White
Federal Reserve Bank of New York	Ms. HaeRan Kim Mr. Theodore Lubke
Bank for International Settlements	Mr. Masao Okawa Mr. Benjamin Cohen

Table of contents

1. SUMMARY AND RECOMMENDATIONS

Background and objectives

In recent years, the various committees of the Group of Ten (G-10) central banks have published numerous reports on the implications of the very rapid growth of over-the-counter (OTC) derivatives activities in terms of risks to banks and other counterparties to those transactions and risks to the financial system as a whole. However, none of these reports has provided a comprehensive survey and analysis of the practices and procedures that participants in these markets actually use to manage their counterparty risks. The Committee on Payment and Settlement Systems (CPSS) and the Euro-currency Standing Committee (ECSC) jointly organised a study group to fill this gap.

Specifically, the study group was given two objectives. First, it was to coordinate a survey of OTC derivatives dealers designed to develop a clear and comprehensive understanding of existing policies and procedures for documenting, processing and settling OTC transactions and for managing the associated counterparty risks. Secondly, it was to identify any weaknesses in practices that appear to exacerbate counterparty risks significantly or even possibly pose risks to the financial system generally, and to consider how changes in practices, including new services, might mitigate those risks.

This report presents the conclusions of the study group's work. It identifies the risks associated with OTC derivatives and describes the practices commonly used by dealers to settle their transactions and to manage those risks. It then presents further analysis of the risk implications of: (1) reported delays in documenting and confirming transactions; (2) the rapidly expanding use of collateral; and (3) the potential expansion of clearing houses. Based on this analysis, the study group makes a series of recommendations for actions by derivatives counterparties, prudential supervisors and central banks that would reduce risks to counterparties and to the financial system.

Existing policies and procedures

Overview. The study group coordinated interviews with 30 leading dealers in OTC derivatives, including two or more from each of the G-10 countries. The interviews were organised around a standard questionnaire that was distributed to the dealers in advance of the interviews. (The questionnaire and a list of the dealers interviewed are provided at Annex 2.)

Overall, the results of the interviews indicate that practices for processing trades and managing counterparty risks are broadly similar in all the G-10 countries. Standard legal agreements and confirmation templates (especially those developed by the International Swaps and Derivatives Association (ISDA) but also some national master agreements) are used to document most transactions. Transaction processing, from data capture through confirmation and settlement, is increasingly automated, although the more structured transactions still usually require manual intervention. Netting and, to a growing extent, collateral agreements are used to mitigate counterparty credit risks. Finally, the vast majority of OTC transactions are settled bilaterally between the counterparties; within the G-10 countries, only in Sweden is a significant volume of OTC derivatives transactions settled through a clearing house, although the London Clearing House plans to offer clearing to the largest market participants, beginning in 1999.

Master agreements. Dealers in all the G-10 countries use master agreements to establish the terms and conditions of OTC derivatives transactions, both with other dealers and with end-users. Dealers prefer to use a single master agreement for all their transactions with one counterparty, in order to minimise counterparty credit exposures by applying close-out netting provisions (discussed further below) to the broadest possible set of obligations. The most widely used master agreements are those developed by ISDA, although national master agreements are also used.

Although many dealers aim to complete a master agreement before executing their first transaction, all dealers said that they sometimes undertake trades with new counterparties before signing a master agreement, the negotiation of which is often protracted. Consequently, all dealers had backlogs of uncompleted agreements with counterparties with whom they had executed transactions. For most, the backlogs concerned between 5 and 20% of their counterparties, but for some the backlog was as high as 30%.

Most dealers acknowledged that the failure to complete a master agreement can exacerbate credit risks by jeopardising a dealer's ability to close out transactions and net obligations in the event of a counterparty's default. For this reason, dealers often include in confirmations, either by reference or explicitly ("long-form confirmations"), key provisions of the master agreement, including close-out netting provisions. Most dealers also have procedures in place to monitor the backlog of unsigned master agreements and to prioritise efforts to clear the backlog.

Confirmations. Almost all OTC derivatives transactions are executed by telephone. Once a trade is executed, it is confirmed and settled bilaterally by the counterparties. The primary purpose of issuing confirmations is to ensure that the counterparties agree on the economic terms of the trade. For trades between dealers, both parties usually issue a confirmation, while end-users typically review confirmations prepared by dealers. Dealers generally send out confirmations between one and five days after the trade date, usually by fax or telex. S.W.I.F.T. is used principally for forward rate agreements (FRAs) and foreign currency options.

All dealers have unconfirmed transactions outstanding, that is, with the confirmation not returned by the counterparty or for which a confirmation received from the counterparty does not match the dealer's own confirmation. Some counterparties, especially (but not exclusively) end-users, are reportedly slow to respond to confirmations. Also, confirmations frequently do not match. Most firms reported discrepancies in 5 to 10% of confirmations received, but some reported percentages as high as 30% or even 50%. As a result, the most active dealers reported backlogs of hundreds of unconfirmed trades, a small but significant share of which had been outstanding 90 days or more.

Most dealers acknowledged that the failure to confirm trades heightened legal risks (by jeopardising the enforceability of transactions) and market and credit risks (by allowing errors in trade records and management information systems to go undetected). However, many dealers noted that oral contracts are legally enforceable in many jurisdictions and that traders' telephone conversations are routinely recorded and the tapes retained (typically for six months). The majority of discrepancies in confirmations reportedly involve less important terms, such as conventions that determine the precise date when payments are due, rather than the material economic terms that are key inputs to measures of market and credit risks.

Settlement. OTC derivatives may require payments periodically throughout the life of the transactions, on maturity, or both. Master agreements provide for the netting of payment obligations in the same currency on the same value date. In practice, however, the extent of payment netting is limited by systems constraints, such as incomplete systems integration, that make it difficult for dealers to calculate and administer net payments. Nonetheless, for most firms, payments relating to OTC derivatives constitute a small share of the total value of their payments.

Close-out netting. Perhaps the most significant risk faced by OTC derivatives dealers is counterparty credit risk. Close-out netting is a powerful tool for mitigating this risk. A master agreement typically provides that, in the event of a counterparty's default, the non-defaulting counterparty can accelerate and terminate all outstanding transactions and net the transactions' market values so that a single sum will be owed by, or owed to, the non-defaulting counterparty. Dealers believe close-out netting is enforceable in nearly all the G-10 countries but acknowledge that there are countries in which enforceability is doubtful. Legally enforceable netting provisions reportedly reduce aggregate counterparty credit exposure by 20 to 60%.

Collateral. In recent years some dealers have rapidly expanded their use of collateral to mitigate counterparty credit risks. Those dealers with the most advanced programmes collateralise transactions with between 10 and 30% of their counterparties. For most dealers, however, the use of

collateral is much less extensive. Nonetheless, nearly all the dealers reported that they expect usage to expand rapidly in the near future.

The ISDA credit forms (each referred to as a credit support annex (CSA)) that go with its master agreement have become the standard type of documentation. Most national master agreements also have a specific collateral annex. The CSA includes a schedule of elections to be negotiated between the counterparties, including a counterparty's threshold, that is, the amount of uncollateralised credit exposure that the other party is willing to accept. In general, the threshold reflects the counterparty's credit rating: the higher the rating, the larger the threshold. Counterparties also need to reach agreement on the types of collateral that can be posted. Most firms accept G-7 or OECD sovereign debt and cash. A few also accept corporate debt and equities.

The frequency with which dealers make calls upon their counterparties for collateral varies. Most dealers calculate exposures and collateral values daily and, under the CSA, they have the right to call for collateral on any business day on which it is owed. In fact, many call for collateral only weekly or monthly, unless the unsecured exposure is unusually large. Where the permission of the collateral giver is required for the reuse of collateral, that is, to use collateral received from counterparties to meet collateral demands from other counterparties or to obtain funding in the repo market, this is usually granted by dealers but less often by end-users. However, except in the United States, dealers seldom reuse collateral, most often because they do not yet have the requisite systems to account for reused securities and ensure that they can be returned promptly when necessary.

Dealers acknowledge that, while collateral reduces credit risk, it can add to their legal and operational risks. Firms are now invariably seeking legal opinions on the enforceability of collateral agreements both in jurisdictions where collateral is held and in those where counterparties are located. Dealers are generally comfortable about enforceability in jurisdictions where collateral is held but admit that enforceability upon a counterparty's insolvency may be uncertain in many jurisdictions. With regard to operational risk, dealers noted that implementing the CSA is operationally demanding. Some dealers have developed integrated internal collateral management systems to ensure that collateral is called and received. A few are outsourcing parts of the collateral process by using the collateral management services offered by Cedel Bank or Euroclear.

Analysis of key issues and concerns

The study group's review of the results of the dealer interviews led it to identify three sets of issues for further analysis. These issues were the implications for counterparty risks and systemic risk of: (1) delays in completing master agreements and confirming transactions; (2) the rapidly expanding use of collateral; and (3) the potential expansion of clearing houses for OTC derivatives.

Delays in documenting and confirming transactions. Where close-out netting is enforceable, use of master agreements can reduce counterparty credit risks significantly. However, the practice of executing transactions before signing a master agreement may jeopardise a dealer's ability to close out and net outstanding transactions in the event of its counterparty's default. Some jurisdictions permit close-out netting upon a counterparty's insolvency only if the parties had entered into a master agreement.

As noted above, when transactions are executed prior to the signing of a master agreement, most dealers seek to obtain the benefits of close-out netting by documenting transactions with confirmations that incorporate the standard terms of the master agreement by reference or that explicitly include close-out and netting provisions. The use of such confirmations may achieve the desired end. However, before relying on these measures, dealers need to conduct legal due diligence to determine whether these additional legal terms in a confirmation constitute a valid and enforceable contract between the parties. While some dealers reported that they had performed the necessary legal analysis, others seemed unduly sanguine about the legal issues involved.

Given that counterparty credit risks can be exacerbated significantly, at least in some jurisdictions, by failure to complete a master agreement, the study group sought to identify practices

that can be effective in reducing backlogs of unsigned master agreements or mitigating the associated risks. Its interviews with the dealers suggested that the following practices can be quite effective: (1) strict enforcement of policies requiring the use of master agreements; (2) close monitoring of exceptions to the policy (which typically require the approval of the dealer's credit department) through creation of a log of unsigned master agreements and periodic dissemination of the log to senior management; (3) the setting of priorities for completing master agreements based on an assessment of the extent to which credit risk is exacerbated; and (4) clear assignment of responsibility for clearing the backlog and the provision of the necessary resources to those responsible. Finally, where uncompleted documentation raises doubts about the ability to close out or net transactions, credit exposures should be measured on a gross basis over the entire remaining life of the contracts.

Turning to outstanding confirmations, the failure to confirm transactions may jeopardise the enforceability of a transaction or the right to net it against other transactions. Some jurisdictions have a statute of frauds that requires certain contracts to be written and signed if they are to be enforced. The right to include the unconfirmed transaction in the close-out netting calculation would also be jeopardised - netting depends not only on the enforceability of the master agreement but also on the enforceability of the transactions covered by the master agreement. In jurisdictions that enforce oral contracts, failure to confirm would not affect a transaction's enforceability. Nonetheless, even in those jurisdictions, written confirmations perform an important evidentiary function in resolving disputes with counterparties. The failure to confirm transactions also exacerbates market risks and credit risks in those instances (reportedly relatively few) when it allows material errors in a firm's records of its transactions to go undetected. Quantitative measures of market risk and credit risk are only as good as the transactions data on which they are based.

In the short run, dealers can mitigate the risks associated with outstanding confirmations by enhancements to their internal systems for capturing trade data and generating confirmations. In many instances, the capture of data on OTC transactions and the preparation of confirmations remains a manual process. However, even if automation allows a dealer to promptly dispatch accurate confirmations, transactions may remain unconfirmed because of delays or errors attributable to its counterparties. In such circumstances, the backlog of outstanding confirmations may nonetheless be reduced by many of the same practices that were identified above as being effective in reducing the backlog of unsigned master agreements.

Even if dealers adopt the most effective internal policies, however, significant delays in confirming some transactions are likely to persist until confirmations are standardised and automated systems for matching confirmations become available. One possible approach is the use of electronic confirmation matching services such as S.W.I.F.T.'s Accord. But some dealers see limitations to this approach. Any service would need to have a critical mass of users to justify the cost of participation. In the case of S.W.I.F.T., access to the network is not available to all counterparties, and the new Accord system cannot handle the more structured OTC products. Because of these limitations, some of the dealers interviewed are exploring various alternatives to S.W.I.F.T.

Rapidly expanding use of collateral. The use of collateral can significantly reduce counterparty credit risks and thereby enhance the stability of OTC derivatives markets. Nonetheless, the use of collateral does not eliminate credit risk and may entail other risks: liquidity, legal, custody and operational risks. If these risks are not managed effectively and dealers use the collateral agreement to free credit lines and capital and enlarge their business, counterparty risks may increase.

If enforceable, a collateral agreement generally reduces losses in the event of a counterparty's default. The effect on current exposure, that is, the loss if default were to occur immediately, is relatively straightforward, but assessment of the effects on potential future exposures is quite complex. Although the structure of collateral agreements tends to limit the occasions when collateral values fall significantly short of credit exposures, it does not eliminate shortfalls, even if the dealer takes full advantage of rights to collateral. Furthermore, in one respect, collateral agreements can increase losses in the event of a counterparty's default. In the absence of a collateral agreement, a counterparty has no current exposure if the market value of the portfolio is negative. However, if the counterparty with the negative exposure has provided collateral to the other counterparty, the former can be exposed to loss in some cases in the event of the latter counterparty's default.

Collateral agreements expose counterparties to liquidity pressures. On a day-to-day basis, if the market values of a counterparty's contracts decline, it may be called upon to deliver collateral. Dealers' OTC derivatives books tend to be relatively balanced, and large parts of the books may be covered by collateral agreements with counterparties. If dealers have the systems needed to reuse collateral, they may be able to meet a substantial portion of collateral demands by using collateral received from other counterparties.

The primary legal risk associated with collateral is the risk that the collateral agreement might not be enforceable. The collateral taker must conduct due diligence to ensure that the collateral agreement constitutes a valid and binding agreement. The collateral taker also needs to determine what law governs the creation, perfection and priority of a security interest and whether the applicable law imposes any technical requirements that must be met to make the security interest enforceable. Finally, the collateral taker needs to review the law governing the collateral provider's insolvency and determine whether it can enforce its security interest upon the provider's insolvency. These issues can be complex even when only a single legal jurisdiction is relevant, and this complexity is compounded in cross-border agreements, which are quite common.

The administration of collateral agreements requires the development of complex information systems and a variety of internal controls. Consequently, operational risk is very significant in collateral programmes. If, as a result of systems deficiencies or internal control weaknesses, transactions or collateral are valued inaccurately or the terms of collateral agreements are inaccurately recorded, insufficient collateral may be called. Collateral holdings must be monitored to ensure that collateral is received when called. On the other hand, implementation of the systems and internal controls needed to meet these challenges can result in very significant enhancements to counterparties' risk management capabilities. The daily marking-to-market of contracts promotes effective management of both market risk and credit risk. Perhaps most importantly, the comparison of portfolio values with counterparties provides an external validation of internal valuations of transactions.

Collateral agreements may give rise to custody risk, that is, the risk of loss of securities received from counterparties and held in custody because of insolvency, negligence or fraudulent action by the custodian. Some derivatives dealers seek to reduce custody risk by holding any securities in their own account at a central securities depository. Where a custodian is used, the key to avoiding losses from custody risk is often the separation (segregation) of the collateral taker's assets from those of the custodian and other dealers.

Despite the widespread use of bilateral netting, OTC derivatives have become a significant source of credit exposures between the global financial institutions that are the largest dealers. Consequently, if a major global financial institution were to fail, losses to other dealers on OTC derivatives would be a potential channel for the transmission of systemic disturbances. The collateralisation of inter-dealer exposures in principle could greatly reduce the likelihood of these systemic disturbances being transmitted through that channel. However, as noted above, the use of collateral entails other types of risk, including legal risk and liquidity risk, which, if not managed effectively by dealers, could also pose threats to the financial system. With respect to legal risk, there is the risk that in the event of a counterparty's insolvency collateral agreements might prove unenforceable in one or more relevant jurisdictions. Such a development could result in widespread losses, because many counterparties might have relied upon the enforceability of the agreements and incurred exposures that they would have avoided if they had suspected the agreements were unenforceable. With respect to liquidity risks, as the usage of collateral grows, dealers may become more vulnerable to liquidity pressures; large changes in market prices could produce significant demands for collateral. Thus, it will become increasingly important for dealers to conduct stress tests to estimate potential demands for collateral and to take whatever steps are necessary, including steps to allow effective reuse of collateral, to ensure that they can meet the estimated demands. If dealers fail to do so, collateral agreements could add significantly to liquidity pressures during periods of market turbulence.

Clearing houses. A clearing house substitutes itself as central counterparty to all transactions that its members agree to submit for clearing. The use of a clearing house has the potential to mitigate each of the types of counterparty risk associated with OTC derivatives. With respect to credit risk, clearing would achieve multilateral netting, which would reduce its members' credit exposures on the contracts cleared. Margining arrangements typically employed by a clearing house would then eliminate or collateralise the net exposure on a daily basis. In addition, if a clearing house employs effective risk management controls, it may be more creditworthy than most, if not all, existing counterparties. However, because clearing houses currently plan to clear only relatively simple instruments, the benefits of multilateral netting may be limited. Non-cleared transactions would continue to be covered by bilateral netting agreements with the original counterparties, and the bilateral net exposures on non-cleared contracts might increase. Furthermore, dealers that have already collateralised their OTC transactions may perceive the potential for further reductions in credit risk to be limited, even in the cleared transactions. In practice, dealers will participate in a clearing house only if they (and their counterparties) perceive benefits, including reductions in credit risk. But the factors that tend to limit potential reductions in credit risk may limit participation in clearing houses.

A clearing house has the potential to reduce liquidity risks by broadening the scope of payment netting. However, because the size of payments associated with OTC derivatives is relatively small, so too are the potential benefits of payment netting. Legal risk would also tend to be reduced by clearing. A clearing house's default procedures are often supported by specific provisions of national law, and a clearing house is highly unlikely to permit the kinds of delays in completing documentation that are observed for non-cleared transactions. A clearing house could also reduce operational risks by imposing high standards of operational reliability on its members and by promoting further development of automated systems for confirming transactions.

From a systemic perspective, clearing houses tend to concentrate risks and responsibilities for risk management. The key issue is how effectively a clearing house manages the risks to which it is exposed. Clearing houses for exchange-traded derivatives in the G-10 countries impose a combination of risk management safeguards that generally have proved quite effective. Those same safeguards appear equally effective when applied to the relatively simple OTC contracts. Admittedly, such contracts must be valued on the basis of financial models rather than market prices for the contracts, but clearing houses already clear various products for which they do not have market prices and have not encountered any apparent difficulties. OTC contracts may also take longer to close out than most exchange-traded contracts, but a clearing house could compensate by imposing higher margin requirements or maintaining larger supplemental financial resources.

Recommendations

For each of the areas discussed above, the study group has identified actions by market participants and national authorities that would mitigate risks to OTC derivatives counterparties and enhance the stability of global financial markets.

With respect to delays in documenting and confirming transactions:

- Derivatives counterparties should review the backlogs of unsigned master agreements and outstanding confirmations, assess the risks entailed, and take appropriate steps to manage the risks effectively.
- Derivatives counterparties should assess the potential for reducing backlogs and associated risks through the use of existing or new systems for the electronic exchange or matching of confirmations.

- Prudential supervisors should review the backlogs and associated risks at institutions they supervise (especially derivatives dealers), assess the effectiveness of the institutions' policies and procedures for limiting the associated risks, and encourage improvements in practices where appropriate.

With respect to the expanding use of collateral:

- Derivatives counterparties should assess the legal risks (including those arising in cross-border arrangements), operational risks, liquidity risks and custody risks associated with their use of collateral and ensure that these risks are managed effectively.
- Prudential supervisors should consider developing supervisory guidance on the use of collateral as a means of reducing credit risk, including guidance on operational risks and on legal due diligence.
- Derivatives counterparties, prudential supervisors and central banks should encourage governments to take action where necessary to reduce legal uncertainty about the enforceability of collateral agreements.

With respect to the potential use of clearing houses:

- Derivatives counterparties should assess the potential for clearing houses for OTC derivatives to reduce credit risks and other counterparty risks, taking into account the effectiveness of the clearing house's risk management procedures and the effects of clearing on their bilateral credit risks on contracts that are not cleared.
- Central banks and prudential supervisors of counterparties should ensure that there are no unnecessary legal or regulatory barriers to the establishment of clearing houses for OTC derivatives. They should also ensure that clearing houses adopt effective risk management safeguards, including arrangements for covering losses from the failure of any participant. In this regard, it should be noted that existing and prospective clearing houses for OTC derivatives of which the study group is aware are clearing houses for exchange-traded derivatives that are already subject to prudential regulation and oversight by national authorities.

2. INTRODUCTION

Many of the characteristics and implications of OTC derivatives have already been thoroughly investigated and analysed by the G-10 central banks. The Basle Committee on Banking Supervision issued risk management guidelines for derivatives in July 1994 that identified the types and sources of risk to counterparties to OTC transactions and discussed sound risk management practices for each type of risk. The macro-prudential implications of OTC derivatives have been considered in a series of reports prepared under the auspices of the Euro-currency Standing Committee (ECSC).[1] The private sector has also produced important studies of the same issues, notably *Derivatives: Principles and Practices*, the influential report issued by the Group of Thirty in July 1993.

With the exception of the Group of Thirty's report, however, none of these earlier studies has attempted a comprehensive description of the policies and procedures actually used by OTC derivatives counterparties to document, process and settle OTC transactions and to manage the

[1] See Euro-currency Standing Committee (1986, 1992, 1995).

associated counterparty risks.[2] Moreover, some significant changes in practices have occurred since the Group of Thirty's report. The use of close-out netting has become more widespread. And, perhaps most important, during the last year or two the use of collateral to mitigate counterparty credit risks has been growing rapidly. Further significant changes in practices may be imminent, as new services are being offered, including confirmation matching, collateral management and clearing houses (multilateral netting systems).

This report has been prepared by a study group organised jointly by the CPSS and the ECSC. The study group's mandate was to fill the gap identified above by making a thorough investigation and analysis of the policies and procedures actually employed by OTC derivatives dealers. Specifically, the study group was assigned two objectives. First, it was to develop a clear understanding of existing policies and procedures relating to the documentation, processing and settlement of OTC derivatives transactions and the management of the associated counterparty risks. Secondly, it was to identify any weaknesses in practices that appear to exacerbate counterparty risks significantly or even possibly pose risks to the financial system generally and to consider how changes in practices, including new services, might mitigate those risks.

The next section provides background on the defining characteristics of OTC derivatives and on the size of the markets for these instruments. Section 4 identifies and discusses the types and sources of risk in OTC derivatives transactions. Section 5 describes the practices and procedures that OTC derivatives dealers employ to manage their counterparty risks, based on interviews with 30 dealers in the G-10 countries that members of the study group conducted in late 1997 and early 1998. Based on its analysis of the results of these interviews, the study group identified three sets of issues for further analysis. These issues were the implications for counterparty risks and systemic risk of: (1) delays in documenting and confirming transactions; (2) the rapidly expanding use of collateral to mitigate counterparty credit risks; and (3) the potential expansion of clearing houses (multilateral netting systems) for OTC derivatives. The study group's analysis of these issues and concerns is presented in Section 6. The annexes comprise: a glossary (Annex 1); a copy of the questionnaire used in the study group's interviews and a list of respondents (Annex 2); a description of certain widely used legal agreements (Annex 3); details of various confirmation matching, collateral management and clearing services being offered or soon to be offered to OTC derivatives dealers (Annex 4); and a bibliography (Annex 5).

3. BACKGROUND

A derivatives transaction is a financial contract whose value depends on the values of one or more underlying reference assets, rates or indices. Although some derivatives contracts have very complex terms, for analytical purposes all can be divided into basic building-blocks of forward contracts, options or combinations thereof. A forward contract obligates one counterparty to buy, and the other counterparty to sell, a specific amount of an underlying asset at a specific price on a specific date in the future. In an option contract the buyer pays a premium to the seller for the right, but not the obligation, to buy (a call option) or sell (a put option) a specific amount of the underlying asset at a specific price (the strike price) during a specific period (an American-style option) or on a specific date (a European-style option). Derivatives transactions may be settled through delivery of the reference asset or through cash settlement, that is, a payment from one counterparty to the other that equals the economic loss to the one (and gain to the other) from the change in the value of the contract between the transaction date and the settlement date. Certain contracts (for example, interest rate swaps) may also obligate counterparties to make periodic cash payments prior to the maturity (or expiration) date of the contract.

---

[2] OTC derivatives can be defined broadly to include foreign exchange forwards and other exchange rate contracts. The settlement of foreign exchange transactions, which are not the primary focus of this study, has been analysed thoroughly in Committee on Payment and Settlement Systems (1996, 1998).

OTC derivatives are privately negotiated transactions that typically are executed by telephone. These contracts are offered internationally by dealers to end-users and other dealers. The relationship between the counterparties is exclusively principal-to-principal. Brokers may be used to locate counterparties, but the brokers are not themselves counterparties to the transactions. The dealers are primarily large international financial institutions - mostly banks but also some securities firms and insurance companies, as well as a few affiliates of what are primarily non-financial firms. End-users include banks, insurance companies, pension funds, other financial institutions, non-financial corporations, governments, supranational entities (for example, the World Bank) and high net worth individuals.

The counterparties bilaterally negotiate the economic and credit terms of the transactions. Although the documentation tends to be standardised in many respects, important aspects of both the economic and the credit terms can be customised.[3] While certain types of relatively simple ("plain vanilla") economic terms are frequently chosen, more complex ("structured") terms are not at all uncommon. In the case of credit terms, counterparties can elect to expand a standard list of events of default and must decide whether and, if so, on what terms credit exposures should be collateralised. Furthermore, transactions are confirmed and settled bilaterally between the counterparties. Transactions are seldom terminated or assigned (that is, transferred to a third party) prior to maturity; doing so requires the consent of both counterparties.

The aforementioned characteristics of OTC derivatives distinguish them from exchange-traded derivatives (futures and options). Exchange-traded derivatives are transacted on a central trading floor or through an electronic trading system and are cleared and settled centrally through the exchange's clearing house, which acts as central counterparty to all the contracts.[4] The economic terms of exchange-traded contracts - the underlying assets, amounts, delivery or expiration dates and strike prices (for options) - are relatively standardised.[5] Credit terms are also standardised - clearing members are subject to common membership requirements and collateral (margin) requirements. The standardisation of terms and the creation of a central counterparty tend to make the contracts more liquid than OTC derivatives; indeed, exchange-traded contracts are typically closed out prior to delivery or expiration through offsetting transactions.

The most comprehensive information on the types of OTC derivatives traded and the amounts outstanding is provided by a central bank survey that collected data on contracts outstanding as of 31st March 1995.[6] On the basis of that survey, the global notional amount of OTC derivatives outstanding on that date was estimated to total $47.5 trillion. (This included an estimated $6.8 trillion to cover gaps in reporting.) The breakdown by reference asset category and contract type of the $40.7 trillion actually reported is shown in the left-hand column of Exhibit 1. As can be seen, the most common reference assets were interest rates and exchange rates. Contracts on individual equities and equity indices and on commodities were also traded, but on a much smaller scale. In terms of specific instruments, the most common were interest rate swaps, foreign exchange forwards and FRAs.

The central bank survey also provided data on the gross market values of OTC derivatives contracts outstanding at the end of March 1995, that is, the costs that would have been incurred if the outstanding contracts had been replaced at prevailing market prices. Gross market values provide a more meaningful indication of the economic significance of contracts outstanding than notional amounts because they more accurately measure the transfer of price risk via those instruments. By this measure, the aggregate size of the OTC derivatives markets was $2.2 trillion (including an estimated $0.5 trillion to cover gaps in reporting). As can be seen in the far right-hand column of Exhibit 1, the ratio of gross market value to notional principal amount varied considerably with the underlying

---

3 Documentation for OTC derivatives will be discussed in greater detail in Section 5 and Annex 3.

4 For a description and analysis of clearing arrangements for exchange-traded derivatives, see Committee on Payment and Settlement Systems (1997).

5 In recent years, however, several exchanges have introduced "flex" options, which allow the amounts, expiration dates and strike prices to be customised, albeit only within certain ranges.

6 See Bank for International Settlements (1996).

reference asset and instrument type. Whereas by notional amount interest rate contracts were the largest category, by gross market value foreign exchange contracts were the largest. This is because interest rate contracts, unlike foreign exchange contracts, often require periodic payments that in effect amortise any exposures over the life of contracts and because interest rates tend to be less volatile than exchange rates. When measured by gross market values, the size of the OTC derivatives markets was quite significant, but still considerably smaller than the size of securities markets ($26.3 trillion outstanding in the OECD countries at the end of March 1995) or international banking markets ($8.3 trillion).[7]

Exhibit 1

Reported notional amounts and gross market values of OTC derivatives outstanding[1]

(31st March 1995)

Reference asset category and instrument type	Notional amounts outstanding		Gross market values		Gross market values as a percentage of notional amounts outstanding
	In billions of US dollars	Percentage share[2]	In billions of US dollars	Percentage share[2]	
Foreign exchange	**13,095**	**100**	**1,048**	**100**	**8**
Forwards and foreign exchange swaps[3]	8,699	72	622	71	7
Currency swaps	1,957	11	346	22	18
Options[5]	2,379	17	71	7	3
Other	61	0	10	0	-
Interest rates	**26,645**	**100**	**647**	**100**	**2**
Forward rate agreements	4,597	17	18	3	0
Swaps	18,283	69	562	87	3
Options	3,548	13	60	9	2
Other	216	1	7	1	-
Equity and stock indices	**579**	**100**	**50**	**100**	**9**
Forwards and swaps	52	9	7	14	13
Options	527	91	43	86	8
Commodities	**318**	**100**	**28**	**100**	**9**
Forwards and swaps	208	66	21	78	10
Options	109	34	6	22	6
Total	**40,637**	-	**1,773**	-	**4**

[1] Reported amounts understate true amounts because of gaps in reporting. The BIS estimates total notional amounts outstanding at $47.5 trillion and total gross market values at $2.2 trillion. [2] To put the shares accounted for by different foreign exchange instruments on a comparable basis, percentages have been calculated on data that exclude figures for currency swaps and options reported by dealers in the United Kingdom. [3] Data are incomplete because they do not include outstanding forwards and foreign exchange swaps positions of market participants in the United Kingdom. [4] Notional amounts excluding data from reporting dealers in the United Kingdom totalled $1,307 billion. [5] Notional amounts excluding data from reporting dealers in the United Kingdom totalled $1,995 billion.

Source: Table D-4, Bank for International Settlements (1996).

7 See Bank for International Settlements (1996), p. 1.

The central banks conducted another survey of amounts outstanding as of 30th June 1998. The results will undoubtedly show that the OTC derivatives market grew substantially over the previous three years. Data collected by ISDA, although not as comprehensive as the central bank data, show that the notional principal amount of OTC derivatives outstanding more than doubled from the end of June 1995 to the end of June 1997.[8] Moreover, the innovation that has been the hallmark of OTC derivatives has continued. For example, since the 1995 survey, credit derivatives have become a significant reference asset category.[9]

4. TYPES AND SOURCES OF RISK

Overview

Counterparties to OTC derivatives transactions are subject to the same basic types of risk as counterparties to any other financial transactions: credit risk, liquidity risk, market risk, legal risk, operational risk and custody risk. Losses to OTC counterparties from these sources could, in principle, be so severe as to pose systemic risks to financial markets or payment systems generally. This section defines and discusses each of these types of risk to OTC derivatives counterparties and concludes with a general discussion of the nature of systemic risk. Although this section discusses all the major risks associated with OTC derivatives business, the focus of the report is on the management of counterparty risks; management of market risk in particular is not treated extensively in this report.

Credit risk

Credit risk is the risk of loss from default by the counterparty, typically as a consequence of its insolvency. In the case of OTC derivatives, two types of credit risk are usefully distinguished: (1) pre-settlement risk, which is usually termed replacement cost risk; and (2) settlement risk (or, as it has been termed in previous CPSS reports, principal risk).

In the event that an OTC derivatives counterparty defaults prior to settlement, the non-defaulting counterparty would typically seek to close out the contract and replace it with a contract with the same terms with a different counterparty. Replacement cost risk is the risk that the non-defaulting counterparty will incur a cost (a loss) in replacing the contract.[10] Such a loss will occur only if, at the time of default, the OTC derivatives contract has a positive market value to the non-defaulting counterparty.

Thus, an assessment of replacement cost risk must involve an assessment of (1) the probability of the counterparty's defaulting, and (2) the credit exposure (the potential magnitude of the positive market value, if any) at the time of default.[11] With respect to the first component, default probabilities are often estimated by rating the credit quality of counterparties and translating those ratings into the equivalents of public bond ratings assigned by credit rating agencies. Historical data are then available on the frequency of defaults within the various rating categories.

---

8 The ISDA data exclude many instruments covered by the central bank survey - forward foreign exchange contracts, foreign exchange options, FRAs, and equity and commodity contracts.

9 Surveys by the British Bankers Association estimated that the notional amount of credit derivatives outstanding globally reached $170 billion at year-end 1997, compared with only $20 billion at year-end 1996.

10 The only OTC derivatives contracts that do not entail replacement cost risk are options sold, for which premiums are paid up front. Because the buyer has no further obligations prior to settlement, there is no pre-settlement risk.

11 A further consideration is the extent to which the cost of replacing the contract can be recovered from the defaulting counterparty. An assessment of the potential for a recovery would involve an analysis of the priority of its claim relative to claims of other creditors and the value of assets likely to be available following default. The latter factor can be gauged, albeit crudely, from studies of historical recovery rates that have been conducted by credit rating agencies.

With respect to the second component, the calculation of the current exposure is usually straightforward - it equals the current market value (if positive) or zero (if negative).[12] By contrast, the assessment of potential future exposure (i.e. the potential for a contract to assume a positive market value at different points during its remaining life) is considerably more complex. Various statistical methods can be used to estimate probability distributions for future exposure at different dates during a contract's remaining life. In particular, the 95th or 99th percentile of the probability distributions can be estimated at different dates. Potential future exposure can then be defined as the peak (maximum) value of these estimates. The peak value may occur relatively early in the life of the contract (for example, in the case of most interest rate swaps) or it may occur at maturity (for example, in the case of foreign exchange contracts).

As will be discussed in greater detail in Section 5 and Annex 3, derivatives counterparties often have multiple transactions with one another. In such circumstances, they generally seek to enter into a legal agreement that provides for the netting of obligations under all contracts covered by the agreement in the event of the default of either counterparty. If such an agreement is legally enforceable, the credit exposure is the net market value of all the contracts rather than the gross sum of positive market values, i.e. losses incurred in replacing contracts with positive market values can be offset by gains in replacing contracts with negative market values. In such circumstances, the current exposure is the current net market value of the portfolio of contracts (if positive) or zero (if negative). Potential future exposure is the potential for future increases in the net market value of the portfolio.

Another factor that may significantly affect replacement cost credit exposures is a collateral agreement between the counterparties. The structure and mechanics of collateral agreements are discussed in greater detail in Section 5 and Annex 3. Collateral reduces the current exposure of the collateral taker to the collateral giver by the amount of collateral held. Its effect on potential future exposure is more complex, particularly if the collateral agreement provides for rather infrequent recalculation of exposures and collateral values or provides that a counterparty can demand collateral only if the exposure exceeds a certain threshold. Even with such provisions, however, collateral may reduce potential future credit exposure considerably.

As noted earlier, credit losses on OTC derivatives occur only if the counterparty defaults at a time when the contract (or portfolio of contracts subject to a netting agreement) has a positive market value. Analyses of potential credit risk often seem to proceed on the assumption that default is statistically independent of credit exposure, or, equivalently, that the probability of default is uncorrelated to changes in the values of the reference assets that determine the market values of the derivatives contracts. However, default can be highly correlated with the market values of the contracts. To cite an example of recent relevance, if an OTC derivatives dealer enters into a currency swap with a resident of another country in which that resident agrees to pay US dollars in exchange for his domestic currency, in the event that the domestic currency collapses both the market value of the contract and the probability of the counterparty's default will tend to rise dramatically. Although such correlations are difficult to quantify with precision, their existence clearly affects the degree of credit risk quite substantially. Likewise, if collateral is taken to reduce counterparty credit exposures, the effectiveness of such a measure may be reduced significantly if the value of the collateral is negatively correlated with the probability of the counterparty's default or with the market value of the contracts.

Settlement risk is a concern only for those OTC derivatives contracts that provide for an exchange of payments (for example, most foreign exchange contracts) or for delivery of the reference asset in exchange for payment (for example, commodity forward contracts or bond options).[13] Even for these types of contract, principal risk can be eliminated if there is a payment-versus-payment (PVP) or delivery-versus-payment (DVP) mechanism for the currencies or reference asset in

---

[12] The exceptions involve structured OTC transactions for which market quotations are not available. Valuation of these transactions requires the use of statistical models, which are sometimes quite complex.

[13] Although dealers are exposed to non-receipt of payments on other types of contract, such as a single-currency interest rate swap, such exposure is normally considered as part of the contract's replacement cost.

question.[14] Thus, in practice, settlement risk is an issue primarily for foreign exchange contracts, for which a PVP mechanism is generally not available, and for certain physically settled commodity contracts. Where settlement risk exists, the credit exposure (the potential loss in the event of the counterparty's default) equals the full principal value of the contract.

Liquidity risk

Liquidity risk is the risk that a counterparty will experience demands for funds (or collateral) that are too large to meet when due. In most respects, liquidity risks associated with OTC derivatives are qualitatively no different from liquidity risks associated with other obligations. Quantitatively, potential liquidity pressures from OTC derivatives are typically small in comparison with other financial transactions, for example spot foreign exchange transactions.

In some circumstances, however, OTC derivatives could give rise to significant liquidity pressures. For example, some OTC contracts provide for early termination in the event of an adverse credit event such as a credit rating downgrade. If the terminated contracts have a negative market value to the downgraded counterparty, it could be faced with substantial demands for liquidity at a time when meeting those demands could be quite costly. Another potential source of liquidity demands associated with OTC derivatives, which will be discussed in detail in Section 6, is the growing tendency for OTC transactions to be collateralised. In such circumstances, a significant decline in the value of an OTC derivatives portfolio could result in substantial demands for collateral and thus substantial liquidity pressures. Furthermore, some collateral agreements provide for collateral requirements to be triggered or increased in the event of an adverse credit event such as a credit rating downgrade.

Market risk

Market risk is the risk of loss from adverse movements in the level or volatility of market prices of assets. Market risk can be meaningfully analysed only on a portfolio basis, taking into account offsetting positions in particular underlying risk factors (for example, interest rates, exchange rates, equity indices or commodity prices) and correlations among those risk factors. The market risk associated with OTC derivatives transactions is typically analysed by: (1) estimating the sensitivity of individual instruments to changes in the relevant risk factors; (2) aggregating the sensitivities to the risk factors across instruments to determine the portfolio-wide sensitivity to each factor; (3) estimating the magnitude of potential changes in the risk factors; and (4) aggregating across all relevant risk factors, taking into account empirical correlations between changes in those factors.

Market risk is usually adjusted by buying or selling the most liquid instruments that are sensitive to changes in the relevant risk factors. These are typically exchange-traded derivatives or securities, although OTC derivatives are sometimes used. The speed and ease with which exposures to different risk factors can be adjusted varies considerably. The less liquid the instruments used to adjust the risk factors, the greater is the market risk, a phenomenon that in principle can be captured by lengthening the time horizon over which potential adverse movements in the risk factor are measured.

---

[14] A PVP or DVP mechanism ensures that in an exchange of assets a final transfer of one asset is made if, and only if, a final transfer of the other asset is made. For a description and analysis of settlement risk in foreign exchange transactions and PVP, see Committee on Payment and Settlement Systems (1996). For an analysis of DVP in securities settlement systems, see Committee on Payment and Settlement Systems (1992).

Legal risk

Legal risk is the risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced. A contract may be invalid or unenforceable for various reasons. For example, an OTC derivatives transaction, a master agreement or a collateral agreement that supplements a master agreement may be unenforceable because the counterparty or the counterparty's signatory lacks the capacity or authority to enter into the contract (ultra vires). In addition, documentation that contains invalid terms or fails to meet local legal standards (for example a statute of frauds) may be unenforceable in whole or part. In certain jurisdictions, OTC derivatives transactions may be unenforceable because they are deemed to violate gambling laws or because they must be conducted on a recognised exchange (for example a futures exchange).

Even if a contract constitutes a legal, valid and binding obligation of the parties, certain provisions may not be enforceable. For example, close-out netting under a master agreement may not be enforceable upon counterparty insolvency, and the insolvent counterparty's bankruptcy representative may be permitted to "cherry-pick", that is, to repudiate contracts with a positive market value to the non-defaulting counterparty while insisting on performance of those with a negative market value to the non-defaulting counterparty. With respect to a collateral agreement, the collateral taker may not be able to realise the collateral because the collateral arrangement has not been established or perfected in accordance with the requirements of the relevant collateral law. Even if the collateral arrangement has been set up correctly, there is a risk that the relevant insolvency law may impose a stay that prevents the collateral taker from quickly liquidating the collateral, invalidate the collateral arrangement if it was not implemented sufficiently well in advance of a counterparty's insolvency (fraudulent or preferential transfer), or create a preferred class of creditors and force the collateral taker to share the collateral with such creditors.

There is also a risk that an OTC derivatives transaction could be deemed unsuitably complex or risky for a counterparty, which might affect its enforceability against that counterparty. A fiduciary or advisory relationship might be legally presumed when dealing with certain types of counterparty, leading to a greater duty of care and, possibly, some responsibility for losses sustained by the advised counterparty. Disputes about the nature of counterparty relationships can also damage a dealer's reputation, which is critical to its ability to compete in the OTC markets.

Operational risk

Operational risk is the risk that deficiencies in information systems or internal controls could result in unexpected losses. Operational risk is inherent in any financial activity, but arguably is especially significant in the case of OTC derivatives. Timely and accurate information is critical to the management of market risks and counterparty credit risks associated with OTC derivatives, which can change quite rapidly and dramatically as a result of new transactions or changes in market values. But the capture of data on OTC derivatives is often a manual process, subject to delay and human error, and determining accurate market values can be problematic for the more complex OTC derivatives transactions. Internal control weaknesses can lead to losses from fraud or simply from the assumption of risks in excess of those acceptable to the board of directors and senior management of the counterparty. For example, allowing traders to determine the values at which complex OTC derivatives are carried has resulted in significant losses at several firms. Also, the failure to establish or adhere to policies relating to counterparty relationships and the marketing of OTC derivatives has resulted in losses from litigation and damage to a dealer's reputation.

Custody risk

Custody risk is the risk of loss of securities held with a custodian as a result of insolvency, negligence or fraudulent action by the custodian. In OTC derivatives transactions, custody

risk arises principally under collateral agreements in which collateral taken is held by the counterparty receiving the collateral or by a third-party custodian.

Systemic risk

Systemic risk is the risk that the failure of a counterparty to meet its obligations when due will cause other counterparties to fail to meet their obligations when due. Of particular concern to central banks is the possibility that the resulting liquidity and credit problems could be so severe that the liquidity of key financial markets could be impaired or payment and settlement systems could be disrupted. As previous ECSC studies have emphasised, OTC derivatives transactions are a growing and quite significant source of credit exposures between the very largest global institutions.[15] Therefore, should one of these institutions experience financial difficulties, counterparty credit losses on OTC derivatives transactions could in principle be a significant conduit for the transmission of financial shocks.

5. PRACTICES AND PROCEDURES FOR MANAGING COUNTERPARTY RISKS

Overview

This section sets out the practices and procedures typically used by leading dealers in the OTC derivatives market to manage the counterparty risks identified in Section 4. It begins by describing the processes that establish the overall parameters of counterparty relationships: the setting of counterparty credit limits and the negotiation of master agreements. It then turns to the processing of individual transactions, from trade execution through to confirmation and settlement. It concludes with a discussion of the techniques employed to mitigate counterparty risks, notably close-out netting and collateralisation.

This section is based on interviews with two or more leading dealers in each of the G-10 countries. The questionnaire used and the list of respondents are set out in Annex 2. The primary focus of the questionnaire is on interest rate contracts and related instruments (e.g. swaptions, caps, collars and floors), and not on foreign exchange contracts. In practice, however, the scope of dealers' responses depended on the range of contracts covered by the master agreements used to document their transactions, as described below.

The responses suggest that market practice is broadly similar in all countries. Standard legal agreements (such as the 1992 ISDA master agreement and national master agreements) and confirmations are used to document transactions; netting and, increasingly, collateral are used to mitigate credit exposures; and operational risk is being addressed by automating as far as possible the processing of transactions, including confirmations. The great majority of OTC derivatives transactions are settled between counterparties on a bilateral basis; only in one G-10 country (Sweden) are OTC contracts cleared on a significant scale through a central counterparty (a clearing house).

Counterparty credit limits

A dealer's credit department typically imposes a counterparty credit limit vis-à-vis each counterparty. The size of the limit is based on an assessment of the counterparty's creditworthiness, often expressed in terms of a credit rating, which may be a rating published by one of the credit rating agencies or an equivalent rating based solely on the dealer's own credit assessment. The more highly rated the counterparty, the larger is the credit limit.

---

15 See Euro-currency Standing Committee (1992).

The counterparty credit limit usually applies to the dealer's aggregate credit exposure to the counterparty, combining exposures from OTC derivatives and from other sources, for example loans to the counterparty. The exposure on an OTC derivatives transaction is usually measured as the sum of the current exposure and an estimate of the potential future exposure. Where netting of transactions is legally enforceable, exposures are usually measured on a net basis. Where legally enforceable collateral agreements are in place, current exposure is typically measured net of collateral held, and sometimes estimates of potential future exposure are adjusted to reflect future rights to call collateral.

A dealer's traders and marketers are expected not to execute transactions with a counterparty if doing so would create a credit exposure in excess of the counterparty's limit. The credit department may also place further constraints on the terms of transactions with specific counterparties. For example, a maximum maturity may be set on transactions with a relatively weak counterparty or transactions with such a counterparty may be authorised only if the counterparty agrees to provide collateral to cover any credit exposure. Compliance with limits is generally monitored by independent risk managers.

Master agreements

Dealers in all G-10 countries use master agreements to establish the terms and conditions of OTC derivatives transactions, both with other dealers and with end-users. A master agreement sets forth the terms that apply to all or a defined subset of transactions between the parties, including close-out netting and other forms of bilateral netting. Future transactions between the parties are made subject to the master agreement, typically through the use of confirmations which include economic terms and supplement the master agreement. One key benefit of using a master agreement is that it reduces the inefficiencies associated with negotiating legal and credit terms transaction by transaction. But the most important benefit is the potential for reducing counterparty exposure on outstanding transactions through the use of close-out netting provisions. If one party becomes insolvent or otherwise defaults on its obligations, close-out netting provisions, where enforceable, permit the non-defaulting party to accelerate and terminate all outstanding transactions and net the transactions' marked-to-market values so that a single sum will be owed by, or owed to, the non-defaulting party.[16]

The master agreements used by dealers are almost always standard form agreements. The most widely used are those published by ISDA. There are two versions of the ISDA master agreement; the 1992 version is now invariably used where market participants negotiate agreements with new counterparties, but the 1987 version is occasionally still used for longer-standing relationships to avoid renegotiation.[17] In most G-10 countries, separate agreements, drawn up in the national language to meet the requirements of local market practice, are in widespread use by dealers, particularly for transactions with domestic counterparties without international operations.[18] ISDA agreements are, however, frequently used by dealers in countries with national agreements when dealing with foreign counterparties or with domestic counterparties that are internationally active.

Standard master agreements generally contain two parts, the body and a schedule. The body contains the terms (for example, representations and warranties, covenants, events of default, and the terms and conditions for close-out netting and other forms of bilateral netting) that will apply to all covered transactions and the relationship generally, and provides for a number of options (for example, automatic early termination vs. optional early termination). The schedule, which

---

16 The non-defaulting party thus avoids the risk that the defaulting party's bankruptcy representative may enforce those transactions which have a negative market value for the non-defaulting party and repudiate those which have a positive market value for the non-defaulting party.

17 A detailed description of the key features of the ISDA master agreement is given in Annex 3.

18 Examples of such agreements are the Association Française des Banques (AFB) agreement and the German and Swiss Rahmenvertrag agreements. These agreements contain provisions on acceleration and close-out netting similar to those of the ISDA agreements.

supplements and forms a part of the master agreement, contains several elections with respect to the body's options and other negotiated terms that are tailored to accommodate credit, tax and legal concerns, depending upon the circumstances of each counterparty.[19] Parties negotiating a standard master agreement generally agree to the terms contained in the body without amendment, but frequently add special provisions in the schedule to reflect the particular circumstances of a counterparty or the counterparty's jurisdiction. Collateral arrangements are covered separately, usually in a standard annex to the master agreement.

Dealers prefer to use a single master agreement for all their OTC derivatives transactions with a particular counterparty, rather than using separate master agreements to cover different products or transactions with different branches. The primary motivation for using a single master agreement is to minimise credit exposures (thereby freeing up credit lines and reducing collateral and capital costs) through the broadest possible close-out netting of obligations. Nonetheless, in some cases, dealers use a separate master agreement for specific OTC products, for example the International Currency Options Market (ICOM) agreement and the Foreign Exchange and Options Master Agreement (FEOMA) for OTC foreign exchange options. They may also choose to sign separate agreements with individual branches of a counterparty when those branches are located in countries where the enforceability of netting is in doubt. Even where multiple agreements are signed, it is rare for dealers to use "master master" agreements, that is, an additional agreement providing for netting across different master agreements.

Many dealers aim to complete master agreements with counterparties before executing their first transaction. Others begin the process of negotiation, at least where the counterparty is another dealer, only after the first transaction has been executed. In practice, all dealers said that they undertake trades with some new counterparties before signing a master agreement, the negotiation of which is often protracted. Where a master agreement is unsigned, there is generally a requirement for prior approval of transactions by the credit department of the firm, which may refuse to allow transactions to be entered into if there are concerns about the credit quality of the counterparty. There may also be a limit on the amount of business that can be done with a counterparty with which an agreement is not in place.

Most dealers acknowledge that the failure to complete a master agreement can exacerbate credit risks by jeopardising the dealer's ability to close out and net obligations in the event of a counterparty's default. For this reason, when executing transactions with such counterparties many dealers seek to obtain the benefits of close-out netting by including in confirmations a statement that a master agreement will be negotiated and that, until it has been completed, the standard terms of the master agreement are incorporated into the contract. The contract is thereby made to include, if only by reference, the events of default in the standard master agreement, including failure to pay and insolvency, and the right to close out and net. In other cases, they may issue a confirmation which sets out the key provisions of the master agreement in full, including close-out netting (a "long-form confirmation").

All the dealers surveyed reported a backlog of unsigned agreements with counterparties with whom they had executed transactions, in most cases between 5 and 20% of the total of their counterparties; for some the backlog was as high as 30%. The number of uncompleted agreements with counterparties with whom transactions were first executed more than three months previously was smaller but still around 10% of total counterparties at some firms. Some dealers noted that unsigned master agreements are generally with end-users rather than with other dealers and that the volume of transactions executed with such counterparties before completion of a master agreement was low. In some cases, dealers allow only one transaction to be executed before a master agreement is completed. Many firms said that the number of uncompleted agreements had been falling in recent years, partly because of regulatory pressure (for example, the requirement that netting may reduce capital requirements only if a signed master agreement is in place).

---

[19] Examples of credit-related provisions that are sometimes added to the standard agreement are cross-default provisions and additional rights to set off, such as a provision to enable the non-defaulting party to set off amounts owed to it by the defaulter and its affiliates.

In most cases, dealers said that delays in finalising master agreements resulted from difficulties in reaching agreement on amendments to the standard terms, in particular, to credit-related terms such as the addition of non-standard events of default. Delays were not generally related to the complexity of the products to be dealt in under the agreement, although in some cases special provisions for complex products need to be negotiated. Many dealers attribute some delays to the unfamiliarity of certain counterparties, particularly end-users, with the standard documentation.

Most dealers have procedures in place, or are introducing them, to monitor backlogs of uncompleted master agreements and to prioritise efforts to clear backlogs. Typically they maintain a log of unsigned master agreements, which identifies the counterparty and its credit rating, the number of outstanding transactions, the age of the transactions (the time elapsed since the first transaction) and estimates of the counterparty credit exposures. The contents of this log are reported periodically (often monthly) to credit officers and senior management. In many cases, dealers' efforts are concentrated on completing agreements that have been outstanding longest. But in some cases the highest priority is given to finalising agreements with high-risk counterparties or those from jurisdictions where there is cause to doubt the enforceability of contracts before documentation is signed. The number of deals outstanding with the counterparty and the extent to which their net value is positive may also be taken into account. Some firms insert in the confirmation a provision that gives them the right to terminate a contract if a master agreement has not been negotiated within a specified period, but in practice dealers rarely exercise this right.

Transaction processing and settlement

This section examines the procedures used in the market for the execution, confirmation and settlement of OTC derivatives transactions. From a risk management perspective, the objective of market participants in this area is to reduce credit, market and legal risks by ensuring that all transactions are accurately recorded in internal systems, that the details of trades are agreed as soon as possible after execution with the counterparty and any disagreements resolved, and that the firm's settlement obligations are met when they fall due. Firms also aim to reduce operational risk by ensuring that the processing of transactions is as automated as possible, from trade execution through to confirmation and settlement, thereby reducing the risk of error due to manual intervention. In most, but not all, firms, the processing of plain vanilla transactions is highly automated, but more complex transactions invariably require significant manual intervention at many stages of the processing.

Trade execution. Most OTC derivatives transactions are executed by telephone although automated brokerage systems are used for certain foreign exchange derivatives. Traders are responsible for ensuring that trades fall within credit lines for the counterparty and overall trading limits. In some cases, traders have access to online systems showing the availability of credit lines for counterparties; in others, they need to apply to a risk management or relationship officer prior to the execution of a trade in order to ensure that the trade does not breach a limit.

Telephone conversations between traders are almost invariably recorded; some firms also record back office conversations. Tapes are typically kept for six months, although some dealers keep them for a year, long enough to ensure that they are available on the first settlement for most transactions. While few dealers said that tapes had been used to resolve disagreements (and some doubted that they could ever be relied on to do so), most see the tape as potentially valuable evidence of the existence and terms of a trade.

Brokers are used in some transactions, most frequently for common and relatively standardised (plain vanilla) transactions. For example, most dealers use brokers for around 50% (and in some cases 75%) of their single-currency interest rate swaps and FRAs. As in the spot foreign exchange markets, brokers are used by dealers to locate counterparties. Brokers never act as principals in these markets; once they identify two counterparties willing to transact at the quoted price, they pass the name of each counterparty to the other. If the other name is acceptable to each counterparty, that is, if each has a relationship with the other and the credit exposure involved can be accommodated within its counterparty credit limit, the trade is executed. Once it has been executed, the trade is

confirmed and settled between the two parties. Brokers do, however, issue their own confirmations of the trade to both counterparties; some firms find these helpful in providing immediate information on the details of a trade (faster in many cases than the counterparty's confirmation). Broker confirmations are occasionally used by dealers to establish the details of a disputed trade.

Data capture. After the trade has been executed, its details are recorded - including the date, time, counterparty name, instrument, payment dates, etc. Trade data are either input directly into a front office processing system by the traders and fed electronically to the operations area, or recorded on tickets and passed to operations for manual entry into the processing system. At some firms, a distinct organisational unit independent of the front office is responsible for data capture and risk management systems, including monitoring adherence to limits.

Confirmation processing. After a trade has been executed, counterparties confirm its details to each other in order to produce an agreed record of the transaction. Dealers are making increasing use of the confirmation templates developed by ISDA, with little if any amendment; but tailor-made confirmations may be used for certain products or counterparties. The confirmation lists all the economic terms of the transaction (for example, the notional amount, effective date, rates and payment dates) and many legal terms of the trade. In some cases, dealers contact each other, either by telephone or by fax, and check the key terms of a transaction before a formal confirmation is issued.

One or both parties may initiate the formal confirmation process. For trades between two dealers, both parties usually issue a confirmation. End-users typically do not issue confirmations, but review confirmations prepared by dealers. When a firm receives a confirmation, it typically checks all the terms against its own confirmation, which reflects its internal record of the trade. Any discrepancy between the two has to be reconciled and the confirmations reissued for signature by both counterparties. In many cases, dealers will not insist on the return of a signed document if they are satisfied that the confirmation received from the counterparty matches the confirmation that they have issued. In cases where a market participant looks to its counterparty to issue the confirmation, it will check the confirmation received against its internal record of the trade and, if there is no discrepancy, it will sign and return the document. Its counterparty then checks that the confirmation has not been altered or amended.

Confirmations are typically prepared by back office staff who are independent of the traders in the front office. Legal as well as operational staff may be involved, particularly for more complex products or if the firm does not already have a signed master agreement with the counterparty. In the absence of a master agreement, the legal department may prepare the confirmation, to ensure that it incorporates wording to the effect that the transaction is subject to the standard terms of a master agreement.

Dealers generally send out confirmations between one and five days after the trade date. But where confirmation processing is automated, typically for plain vanilla trades and therefore most often at firms whose main business is in vanilla products, they may issue a confirmation on the same day as the trade. In some countries, it is a regulatory requirement for firms to issue confirmations within a certain period of time after trade execution. Whether prepared manually or automatically, most confirmations are issued and returned by fax or telex; in some cases, confirmations are mailed (or a hard copy, for signature and return, is sent out after the telexed or faxed version).

There are standard S.W.I.F.T. messages for confirmations of foreign currency options, FRAs, interest rate swaps and cross-currency swaps. In practice, S.W.I.F.T. is used by dealers principally for confirming FRAs and foreign currency options. Some dealers have begun to use S.W.I.F.T. for confirming swaps since the introduction of revised message standards, approved by ISDA, in late 1997. But few dealers yet have automated links between their OTC derivatives back office and their connection to the S.W.I.F.T. system. Moreover, S.W.I.F.T. can be used only for confirming trades with other S.W.I.F.T. members. Some dealers make use of S.W.I.F.T. message formats in confirmations sent by fax or telex. S.W.I.F.T. also offers a service, Accord, for matching

OTC derivatives confirmations. It is used by some dealers for matching FRA confirmations but not yet for swaps.[20]

All dealers have unconfirmed transactions outstanding - that is, confirmations sent but not returned by the counterparty or, in cases where both parties issue confirmations which are then matched, transactions where they have sent a confirmation but have not yet received a matching one from their counterparty. The number of such trades reported by firms in answer to the questionnaire varied. The most active dealers had several hundred confirmations outstanding, equivalent to between five and ten days' worth of transactions. Although a number of dealers said that the counterparties slowest to return confirmations are end-users, others said that some dealers are also slow to confirm. The number of confirmations outstanding for more than 90 days is a small proportion of the total, but a few dealers reported hundreds of unconfirmed deals in this category. Most dealers acknowledged that the failure to confirm trades heightened legal risks (by jeopardising the enforceability of transactions) and market and credit risks (by allowing errors in trade records and management information systems to go undetected). However, many dealers noted that oral contracts are legally enforceable and that traders' telephone conversations are routinely recorded.

Dealers invariably maintain a log of outstanding confirmations. Efforts to obtain confirmations are then prioritised, typically on the basis of the age of the transaction, the amount of time before a payment is due, whether a master agreement has been signed with the counterparty, and whether there is a current exposure. Counterparty credit quality and relationship with the counterparty are also taken into account. Reports of backlogs are typically made to credit officers and senior managers weekly or monthly. Escalation procedures in case of continued delays include contact by the relationship manager and, rarely, suspension of trading.

Most firms reported discrepancies in 5 to 10% of confirmations received, but some reported percentages as high as 30% or even 50%. The majority of discrepancies involve terms of relatively minor importance, typically conventions which determine when payments are due (business days, day count, etc.), rather than economic terms. Where disagreements over economic terms occur, their resolution can take considerable time, reflecting the complexity of some OTC derivatives trades and the number of economic parameters, particularly when compared with bond or equity trades. This complexity also makes it difficult to automate the processing of many OTC derivatives transactions.

Management information and internal controls. Management's ability to measure, monitor and control credit risks and market risks is critically dependent on timely and accurate data capture and reporting. For those trades for which data capture is automated, with trade details entered at the trading desk flowing automatically into risk management as well as trade processing systems, risk management systems are generally updated with trade information on the trade date, providing management with timely reports. For those trades for which data capture is a manual process, requiring extraction of data from deal tickets, risk management systems are often updated only once a day, typically using data generated by end-of-day batch feeds from other systems; in these cases, updated reports are available to management only once per day (usually in the morning, before trading starts, reflecting the previous day's trades). In some cases, risk management systems are more frequently updated for market risk than for credit risk - market risk reports may be available to management intraday or even in real time, whereas credit risk reports are available daily or even less frequently.

Settlement. Depending on the product and contract terms, OTC derivatives contracts may require payments periodically throughout the life of a trade (for example, interest rate resets on interest rate swaps), on maturity (for example, many options), or both. Standard settlement instructions (SSIs), which set out the agreed details of settlement arrangements (for example, the banks at which payments are to be made), are usually exchanged by the counterparties. Some firms maintain a database of SSIs which automatically feeds into settlement systems and systems that generate settlement confirmations. Some firms confirm settlements several days in advance of the payment date.

---

[20] The netting service of S.W.I.F.T. Accord is not offered for derivatives transactions.

Master agreements, including the 1992 ISDA master agreement, provide for netting of payment obligations between the parties. Where netting is used, it enables firms to reduce a series of payment obligations between each other to a single payment in one direction in each currency for each day. In practice, the extent of payment netting is limited by systems constraints that make it difficult for dealers to calculate and administer net payments, particularly where multiple products or more than one branch office of the counterparty are involved. Most payments are therefore made on a gross basis. Where payment netting is undertaken, it is usually done on the basis of one type of contract or one pair of offices. However, most dealers say that they will seek to net payments, using manual procedures as necessary, when payments are due to and from a counterparty that is expected to default. Such netting may be enforceable only if payment netting provisions have been included in the master agreement.

Settlement and nostro reconciliation procedures for OTC derivatives are the same as those for firms' other payments. Firms undertake a reconciliation process to confirm that expected payments have been received. This can be conducted by a cash management or reconciliation group independent of the front office. For most firms, payments relating to OTC derivatives constitute a small share of total payments value, typically around 5%; even for the most active dealers, the figure reaches only 10 to 15% of all payments.

Close-out netting

Close-out netting is used as a key risk management tool by most dealers. Its use is generally much more extensive than payment netting - usually across multiple products and including whichever offices of the counterparty are located in jurisdictions where such netting is enforceable. Dealers' legal departments are responsible for assessing the enforceability of netting clauses in their master agreements in all relevant jurisdictions. This typically involves obtaining opinions from external lawyers (if necessary, in all relevant jurisdictions, including that of the governing law of the master agreement and the insolvency jurisdiction of the counterparty). Alternatively, dealers make use of legal opinions obtained by market associations on behalf of their members.

Some dealers include under the single master agreement transactions with branches of counterparties that are located in a jurisdiction where netting enforceability is uncertain, although in such cases they usually measure their exposure to that branch on a gross basis. Other dealers "carve out" branches located in such jurisdictions and execute a separate master agreement. Dealers say that while netting is enforceable in nearly all G-10 countries (and a number of countries have recently enacted specific legislation addressing netting or have amended existing legislation), there are countries where doubts about enforceability remain.

The extent to which netting reduces counterparty credit exposures depends on the size and nature of business which is eligible for netting. The greatest reductions arise where there is a large number of trades with a counterparty, some of which will at any time have a positive value and others a negative value. In calculating their exposures to counterparties with whom they have netting agreements, dealers recognise the effect of netting on both current and potential future exposure. In assessing the effect of netting on potential future exposures, many dealers use the rule set out in the Basle Capital Accord, while a few use statistical techniques (such as Monte Carlo simulations) to estimate the effects.[21] Netting of a portfolio of transactions with another dealer will typically reduce gross current exposures by between 20 and 60%; the reduction in exposure to an end-user with contracts that all reflect a particular view on future market movements may be much less.

[21] The Basle Accord allows estimates of potential future exposure to be reduced by as much as 60%, with the reduction increasing in line with the extent to which current exposure is reduced by netting.

Collateralisation

Collateralisation of credit exposures in the OTC derivatives market has increased rapidly in recent years. Most dealers said that they now collateralise exposures arising from OTC derivatives business to some degree. Almost all expect to increase their use of collateral in the future. Dealers use collateral to mitigate their credit exposures and thereby engage in more transactions than would otherwise be possible. This includes transactions for which potential future exposures are highly uncertain (for example, very long-dated interest rate swaps) and transactions with less creditworthy counterparties. It also includes higher volumes of less risky transactions with more creditworthy counterparties (for example, short-term interest rate swaps with other leading dealers). While collateralisation mitigates credit risk, it is also considered to be a source of legal and operational risks. Additional legal agreements must be signed, the enforceability of which has to be assessed just as for master agreements; and systems and procedures are required to ensure that collateral is called from counterparties where needed and its receipt monitored.

Usage. Those dealers with the most advanced collateralisation programmes collateralise their OTC transactions with between 10 and 30% of their counterparties. The proportion of their OTC business volume which is covered may be significantly higher, because collateral agreements are generally signed with counterparties with whom firms do a relatively large amount of business, typically other dealers. But for most dealers the use of collateral is much less extensive; some of the dealers interviewed had as yet completed no collateral agreements. Collateral is used most extensively by dealers located in the United States and the United Kingdom; it is used only to a limited extent by dealers in other European countries, Canada and Asia. However, the use of collateral arrangements is growing quickly in some of these countries.

Some collateral agreements are still "one-way" - that is, they require only one counterparty to post collateral. Such agreements are typically signed where one party is of much higher credit standing. For example, in collateral agreements with hedge funds, often only the hedge fund is required to post collateral, while in agreements with supranationals usually only the dealer is required to do so. Most new agreements, however, are now "two-way" - they require each party to post collateral whenever the exposure of the other exceeds a certain agreed amount (the "threshold").[22] In an increasing number of inter-dealer agreements, thresholds are set at zero for both counterparties, so one of the parties will always be posting collateral.

Structure. Whereas firms until recently developed and used their own legal agreements governing the use of collateral, agreements are now almost invariably documented using ISDA's credit support annex (CSA) to its master agreement.[23] This provides for collateralisation of the net current exposure on the portfolio of transactions covered by the master agreement. Non-standard documentation is used only in cases where a standard agreement may be unenforceable in the jurisdiction concerned or occasionally for structured transactions.

There are several versions of the CSA. The choice of which to use is determined mainly by which is legally most secure and operationally easiest to implement in the relevant jurisdiction. The US law version is structured as a pledge. Typically securities and cash are delivered to the collateral taker (or a third-party custodian specified by the collateral taker), which obtains a security interest in the collateral. It is most often used when dealing with US counterparties or when the collateral is delivered in the United States. The most widely used of the two UK law versions of the CSA is structured as a title transfer. The collateral provider transfers title to the securities to the collateral taker against an agreement that the collateral taker will return equivalent securities to the collateral provider in accordance with the terms of the CSA. ISDA has also developed a Japanese law version of the CSA.

The CSA includes elections to be negotiated between the two counterparties. Thresholds are set according to the current credit standing of the counterparty and may be asymmetric. The lower-

---

22 Even hedge funds reportedly are increasingly able to negotiate two-way agreements.

23 There are now similar collateral annexes for the national master agreements mentioned earlier.

rated counterparty may have a lower threshold than the higher-rated counterparty. Some dealers negotiate a schedule of collateral thresholds linked to the current and prospective credit ratings of the counterparties. If either counterparty's credit rating changes, its threshold changes as provided in the schedule. Some counterparties are required to post collateral even when the other counterparty has no current exposure (this is known as initial margin or the independent amount). But such a requirement is increasingly rare.

Collateral agreements also set out a minimum transfer amount - that is, an amount of collateral below which a counterparty is not required to transfer collateral even if the collateral agreement would otherwise provide for a transfer. As with collateral thresholds, minimum transfer amounts may be asymmetric. The higher the minimum transfer amount, the less frequent are transfers of collateral between the parties to the agreement but the higher are the potential credit exposures. Therefore, the minimum transfer amount takes into account both the cost of transfers and the quality of the counterparty; collateral agreements between dealers often have a relatively high minimum transfer amount, but agreements with less creditworthy end-users tend to have relatively small minimum transfer amounts.

The parties to a collateral agreement specify the types of securities that can be posted. Most firms accept G-7 or OECD sovereign debt and cash and some also accept corporate debt and equities. Many dealers will generally accept only collateral that is recognised by their regulators as reducing credit risk for capital adequacy requirements. Letters of credit are occasionally accepted. In practice, the most common forms of collateral are government securities and cash. Many firms prefer to take securities rather than cash,[24] because cash has to be reinvested and interest paid to the collateral provider and because they may be able to make use of securities to meet collateral demands from other counterparties. But they will generally agree to take cash if it is offered.

Haircuts are invariably applied to securities taken as collateral, that is, the collateral value is discounted relative to current market value. In most cases, the haircut is determined by the volatility of the price of the security over the time that would be required (in normal market conditions) to liquidate it on the default of a counterparty. However, the relationship between haircuts and volatilities is often expressed in simple rules of thumb, which may not be updated frequently to reflect changes in volatility. Correlations between potential future exposures on the derivatives portfolio and securities taken as collateral are not generally taken into account. But those few dealers that accept corporate securities as collateral generally take account of correlations between the probability of counterparty default and the likelihood of the collateral value being impaired; in such cases, they will impose particularly high haircuts or refuse to take certain collateral (for example, equities issued by a firm in the same industrial sector as the counterparty). Haircuts are, however, subject to negotiation between the parties. Where the negotiation results in a lower haircut than they would prefer, several firms take account of this additional risk in setting the other parameters of the agreement such as the threshold or minimum transfer amount.

The frequency with which collateral is called varies. Most dealers calculate exposures and collateral values daily and ensure that they have the right, under the collateral agreement, to call for new or additional collateral from the counterparty every day, subject to the minimum transfer amount. But, because of the inability of their systems (or those of their counterparties) to exchange and match information on the value of derivatives portfolios and to process the collateral movements on a daily basis, many call for collateral only weekly or monthly, unless the unsecured exposure is unusually large - that is, substantially higher than the minimum transfer amount provided for in the CSA. At the opposite extreme, at least one dealer makes collateral calls intraday when market movements are particularly large.

The amount of collateral to be delivered or received is usually confirmed with counterparties by telephone or fax. Procedures for electronic message exchange and matching are being considered by the market. Disagreements over the amount of collateral owed may be difficult to resolve if a large number of transactions are covered by the collateral agreement or if transactions are

---

[24] However, some continental European dealers prefer cash.

particularly complex and, therefore, difficult to value. Collateral agreements such as the CSA set out dispute resolution procedures. If the difference in the calculations of the collateral owed is less than a certain amount, it may simply be split. Otherwise, valuations of transactions may be sought from third-party dealers.

Most firms follow the standard procedures for collateral calls set out in the CSA, which require counterparties to meet a collateral call by delivering cash or securities the day after the call is made.[25] But in some cases, depending on the type of security and the length of the normal settlement cycle, longer periods may be allowed or firms may require same-day delivery. As the collateral used in the OTC derivatives market is largely US Treasury securities, most securities are delivered in the United States. The majority of dealers use custodian banks there. A number of firms are, however, either already using or making plans to use the collateral management services offered by Euroclear and Cedel Bank, which have recently established links to US custodian banks.[26]

Dealers generally wish to be able to make use of securities collateral received from counterparties to meet collateral demands from other counterparties or to obtain funding, for example, in the repo market. Whether reuse ("rehypothecation"[27]) is possible depends in part on the type of legal agreement used. Where the permission of the collateral giver is required for reuse to be legally secure, this is generally given by dealers but less often by end-users. However, except in the United States, most dealers do not in practice extensively reuse collateral that they have received, whatever the legal agreement under which it has been taken. Some dealers are concerned that rehypothecation of pledged securities may impair their security interest in collateral. More often, firms do not yet have the systems to monitor and control collateral when it is reused (for example, to ensure that they can locate and retrieve particular securities that they have reused when they need to return the collateral).

Risk management. Dealers acknowledge that, while collateral reduces credit risk, it can add to legal and operational risks and that these risks have to be managed. A key risk for firms using collateral is that collateral agreements may prove to be unenforceable. Just as for netting agreements, therefore, firms are now invariably seeking legal opinions on enforceability in both the jurisdiction where the collateral is located and that in which the counterparty is incorporated. While dealers are comfortable that collateral is enforceable in the countries where it is most often delivered (provided that the appropriate type of collateral agreement is used), they admit that enforceability upon a counterparty's insolvency may be uncertain in many jurisdictions. ISDA is currently undertaking an exercise to obtain legal opinions on the enforceability of the CSA in a wide range of jurisdictions.

To address operational risk, many dealers are seeking to automate as far as possible the handling of collateral movements. Those using collateral most extensively have developed internal collateral management systems, with automated links to processing and risk management systems, to handle collateral calls and to ensure that collateral is delivered by counterparties. Some are using a third-party collateral management service, such as that of Cedel Bank or Euroclear, to handle parts of the collateralisation process.

Analyses conducted by firms of the effects of collateral on their credit risk exposures are generally at an early stage. In particular, only a few dealers have modelled the effects of collateral on potential future exposures. All firms regard collateral as reducing their current exposures to counterparties. Collateral values are generally deducted from current exposures when measuring usage of credit lines. Nonetheless, most firms with a significant volume of collateral agreements also monitor their exposure (including a measure of potential future exposure) before the deduction of the

---

25 Under the standard terms of the CSA where a party to an agreement has to post collateral, it must do so by the end of the next business day after the call (provided that the call is made before a specified cut-off time). If it fails to post collateral by that time, the party calling collateral must give notice of that failure; the party posting collateral then has a further two business days to make the collateral delivery before it is in default.

26 Annex 4 includes a description of the Cedel Bank and Euroclear services.

27 The term rehypothecation is generally used to refer to the reuse of securities that have been obtained as collateral by a party to a collateral agreement taking the legal form of a pledge.

value of collateral and apply a separate limit to this amount. This additional limit may be set to reflect an assessment of the counterparty's ability to meet future collateral demands.

Collateralisation imposes additional liquidity risk on dealers that have to post collateral. Some market participants have modelled this risk by looking at potential demands for collateral if their credit rating were to be downgraded. One has estimated the liquidity impact of market movements on the collateral it would be required to post if there were to be a large price change against its current positions. Most dealers believe that they could meet such liquidity demands, either because their use of collateral is still limited or because additional collateral is readily obtainable, for example through the repo market.

Other bilateral approaches to credit risk mitigation

Firms occasionally use periodic cash settlements to mitigate credit risk on individual transactions. One or more outstanding transactions are marked to market and then cash settled; the party with an unrealised loss pays the other a sum equal to the loss. Such cash settlements are analogous to the way in which variation margin calls are made by most clearing houses for exchange-traded derivatives. Cash settlements can occur either at routine payment dates (for example, on a swap) or when the exposure exceeds a threshold specified in the contract.

The principal impediment to more widespread use of cash settlements is their operational complexity. Each time a cash settlement is made, the contract terms (rates or notional amounts) have to be adjusted to return the current market value of the contract to zero. For example, on an interest rate swap, if rates fall, the floating rate payer (the party that has a current exposure because of the decline in rates) will receive a payment from the fixed rate payer. The fixed coupon must then be reduced to the prevailing market rate to return the contract value to zero.[28] A further impediment is that the resulting gain or loss may have tax and accounting implications for the counterparties.

For some dealers, early termination options (or "break clauses") are common, particularly for longer-maturity OTC derivatives transactions. Early termination clauses give one or both parties the right to terminate a contract on a pre-agreed date or range of dates (usually several years in the future) and to settle any cumulative changes in value as of the date in question; typically, a ten-year swap would have an early termination option after five years. Early termination options are usually documented in confirmations of individual transactions. Some firms active in the interbank market routinely exercise early termination options to adjust their exposure on a portfolio, in which case they take the early termination date rather than the maturity of the transaction as the duration of the contract for risk management purposes. Others rarely exercise these options and, therefore, do not adjust the maturity of the contracts.

Other techniques for reducing credit risk on a bilateral basis are also used only infrequently. Assignments of OTC derivatives contracts to third parties are rare. They require the consent of the counterparty, which is never given in advance and can have adverse tax implications in some jurisdictions. Negotiated terminations of transactions with other dealers are occasionally used to free up credit lines. Finally, a few dealers reported that they have begun to use credit derivatives to reduce their credit risk to counterparties or to groups of counterparties, for example residents of the same country.

Clearing houses

OTC derivatives can in principle be centrally cleared in a manner similar to exchange-traded derivatives. That is, counterparties to an OTC transaction could agree to substitute the clearing house as central counterparty. Multilateral netting would then be achieved through bilateral netting

---

[28] Alternatively, the notional amount used in computing the fixed rate payer's obligation could be reduced.

between the clearing house and each of its members. The clearing house calculates the net obligations of each participant and settles them with the participant as they fall due.

But within the G-10 countries, only in Sweden is there clearing of OTC derivatives contracts on a significant scale, through the derivatives exchange and clearing house OM Stockholm. OM clears both standardised OTC contracts (interest rate futures contracts identical to those traded on the OM exchange but traded off-exchange) and tailor-made contracts (options and forwards on specific securities, the terms of which, including the maturity and, for options, the exercise price, are negotiated between the parties). The London Clearing House is planning to introduce a clearing service for swaps and FRAs in 1999.[29]

Some dealers identified potential benefits from clearing OTC derivatives. In particular, management of counterparty credit risk and processing of transactions could be delegated to the clearing house. Although clearing house members would be exposed to the clearing house itself, current exposures might be eliminated each day (or several times a day) by the clearing house collecting and paying out variation margin. Other dealers noted that a clearing house would be able to clear only relatively simple contracts and not the more complex products that many trade, and that many of the benefits of clearing have already been achieved through the use of bilateral netting and collateral agreements that allow dealers to control their exposure across a broad portfolio of transactions.[30]

6. ANALYSIS OF KEY ISSUES AND CONCERNS

Three sets of issues were identified for further analysis: (1) delays in documenting and confirming transactions; (2) the rapidly expanding use of collateral to mitigate counterparty credit risks; and (3) the potential use of clearing houses. The study group's mandate included identifying any weakness in risk management practices that might exacerbate counterparty risks and possibly pose systemic risk. Delays in documenting and confirming transactions are examined for their implication for these risks. In addition, as part of its mandate the group analysed two recent developments that could mitigate those risks - the expanding use of collateral and clearing houses for OTC derivatives.

Delays in documenting and confirming transactions

As discussed in the previous section, OTC derivatives dealers typically have policies requiring the use of master agreements to manage the legal and credit risks associated with OTC derivatives. However, one or more transactions are often executed prior to the signing of a master agreement with the counterparty. Indeed, all dealers interviewed reported backlogs of unsigned master agreements with between 5 and 20% (and in some cases more) of their counterparties. However, for some dealers, the number of transactions with such counterparties may be a far smaller percentage of total transactions, either because the counterparties tend to be new counterparties or because the dealers strictly limit the number of transactions pending completion of the master agreement. Similarly, dealers seek to confirm the terms of individual transactions promptly. Nonetheless, some dealers report hundreds of outstanding confirmations, with a small but significant portion outstanding for 90 days or more. Given the size of these backlogs, it is important to analyse carefully the implications for counterparty risks and to consider how the backlogs might be reduced or how the associated risks might otherwise be mitigated.

---

29 In addition, the Exchange Clearing House Ltd. (ECHO, the foreign exchange netting and settlement service) clears foreign exchange forward contracts for its participants.

30 Issues arising from the possible expansion of OTC derivatives clearing are discussed in the next section. Annex 4 includes a description of the OM Stockholm clearing service and of the London Clearing House's SwapClear plans.

Unsigned master agreements. As noted previously, the primary benefit of a master agreement, such as the widely used 1992 ISDA master agreement or a national agreement, is the right given to the non-defaulting party to close out and net all outstanding transactions covered by the master agreement if an "event of default" (as defined in the master agreement) occurs. A master agreement has a standard definition of an event of default, which includes a failure to pay an obligation when due and the insolvency of a party. The parties to a master agreement can expand the standard definition of an event of default to cover other events (for example, an affiliate's default or insolvency) that they deem important in managing their credit risk or legal risk.

Where close-out netting is enforceable, a master agreement can substantially reduce counterparty credit exposure. Before relying upon a master agreement to reduce counterparty exposure, legal due diligence would need to be conducted to ensure that both the master agreement and the individual transactions thereunder constitute valid and binding agreements. Among other things, this entails review of the laws of the relevant jurisdictions to determine: (1) whether each party has the capacity to enter into the master agreement and individual transactions; (2) whether the master agreement has been duly executed by each party's authorised representative, and whether each party has taken all the steps necessary to authorise the master agreement and the transactions; (3) whether the relevant jurisdiction has a statute that requires certain contracts to be written, signed, and contain certain minimum terms if they are to be enforced (statute of frauds) and, if so, whether the master agreement and individual transactions satisfy the statute's requirements; and (4) whether the master agreement's close-out netting provision is enforceable in all relevant jurisdictions upon default or counterparty insolvency.[31]

Even in cases where close-out netting is enforceable, however, the practice of booking transactions with a counterparty prior to signing a master agreement raises a question as to the non-defaulting party's ability to close out and net outstanding transactions in the interim. Assessment of this risk requires review of the laws of the relevant jurisdictions. In some jurisdictions, for example, close-out netting is enforceable only if the parties to the transactions have entered into a master agreement. The review needs to include consideration of whether close-out netting is enforceable in all events of default by a counterparty normally covered by a master agreement and not just an insolvency.

The firms interviewed acknowledged that the non-defaulting party's ability to close out and net may be jeopardised by the booking of transactions prior to signing of a master agreement with a counterparty. However, most of them took the view that they can close out and net transactions in most jurisdictions if confirmations of individual transactions with the counterparty are drafted appropriately. Specifically, when executing transactions without a signed master agreement, most firms seek to obtain the benefits of close-out netting by documenting transactions with a confirmation that incorporates by reference the standard terms of a master agreement. Less frequently, the firms use long-form confirmations, that is, confirmations which set out the key provisions of a master agreement, including those that establish each party's right to close out and net transactions.[32]

Many firms stated that a confirmation that incorporates by reference the standard terms of a master agreement, or a long-form confirmation that contains the key provisions of a master agreement, can constitute a master agreement. However, firms would need to conduct legal due diligence to determine whether these additional legal terms in a confirmation constitute a valid and enforceable contract between the parties.[33] Credit risk is understated if firms manage counterparty risk

---

31 The relevant jurisdictions include: (1) the jurisdiction in which the counterparty is chartered and, if a foreign branch of a counterparty is involved, the jurisdiction in which the branch is located; (2) the jurisdiction whose law governs the individual transactions covered by the netting contract (that is, the master agreement); and (3) the jurisdiction whose law governs the netting contract.

32 In addition, the firms may insert a provision in their confirmations that gives them the right to terminate transactions if the counterparty does not execute a master agreement within a specified time period. The firms rarely exercise this termination right, but they find it useful in motivating the counterparty to execute a master agreement.

33 Some of the issues that a firm needs to examine in conducting such legal due diligence were outlined above.

on a net basis relying upon their ability to close out and net under a confirmation, but the confirmation does not constitute a valid master agreement.

Given that counterparty credit risks can be exacerbated substantially, at least in some jurisdictions, by failure to complete a master agreement, it is worth considering what practices are most effective for reducing backlogs or otherwise mitigating the risks. The study group's interviews with dealers indicate that certain practices can be quite effective. Indeed, several dealers reported having made substantial progress in reducing backlogs and the associated risks. These practices include: (1) clear policies regarding the use of master agreements and strict enforcement of these policies; (2) close monitoring of policy exceptions through creation of a log of unsigned master agreements and, quite importantly, attention by senior management to this information; (3) the setting of priorities for completing documentation based on an assessment of the risks posed by individual uncompleted master agreements; and (4) a clear assignment of responsibility and provision of adequate resources for clearing the backlog, usually to a special documentation unit, with support where necessary from traders and relationship managers. Last but not least, where uncompleted documentation raises doubts about rights to close out or net obligations, counterparty exposures can and should be measured on a gross basis over the entire remaining life of the contracts. Dealers generally follow some of these practices, if not all.

Some dealers have policies requiring completion of a master agreement before executing a transaction with a counterparty. Even when only one transaction exists, the completion of a master agreement gives the counterparty the ability to close out that transaction. With more than one transaction, the ability to net obligations becomes a concern. All firms allow for exceptions to these general policies, however. In particular, the requirement that a master agreement be in place before transacting (or before a second transaction) can often be waived with the approval of the credit officer responsible for the counterparty. While allowing for limited exceptions to a policy may be appropriate, at some dealers exceptions appear to be granted so frequently that the policy appears to have little or no force.

Consequently, even where internal policies seem clearly to support the use of master agreements, it is critical that a mechanism exist for monitoring exceptions, that responsibility for clearing the backlog be clearly assigned, and that those assigned the responsibility have the resources necessary to carry out the job. As reported in Section 5, most dealers maintain a log of unsigned master agreements and have a special documentation unit with responsibility for clearing the backlog. In addition, when counterparties prove recalcitrant about signing master agreements, it often is necessary to involve relationship managers and traders in efforts to bring negotiations to a conclusion. A potentially powerful mechanism for dealing with recalcitrant counterparties is to cease trading if a master agreement is not completed within a reasonable period. Many dealers reported that they have threatened counterparties with such action, and sometimes the threat alone is sufficient to get the master agreement signed. However, few reported actually suspending trading, and many claimed that competitive pressures make it difficult to take such forceful actions.

While the various practices described above have proved effective in reducing the backlog, none of the dealers claimed to have eliminated it. In those instances in which multiple transactions have been executed and the counterparty is from a jurisdiction in which close-out and netting are in doubt without benefit of a master agreement, the simplest and most effective means of ensuring that unanticipated credit losses are not incurred is to: (1) measure credit exposure to the counterparty on a gross basis; and (2) measure potential future exposure over the entire remaining life of the contract, because close-out may not be possible, even if the counterparty defaults early on. Still, this cannot be regarded as a wholly satisfactory substitute for a legally enforceable master agreement. The legally enforceable master agreement would further mitigate credit risk by defining more broadly an event of default that can trigger close-out netting, and it could reduce other legal risks by defining more clearly the terms of the counterparty relationship.

Outstanding confirmations. The failure to confirm a transaction may jeopardise its enforceability or the ability to net it against other transactions. Furthermore, to the extent that it allows errors in recording transactions to go undetected, an unconfirmed transaction may cause market or counterparty credit risks to be mismeasured and, most seriously, to be underestimated.

Some jurisdictions may have a statute that requires certain contracts to be written, signed, and contain certain minimum terms if they are to be enforced. In these jurisdictions, the failure to confirm an individual transaction in writing may render the transaction unenforceable. If so, assuming that the non-defaulting party has a right to close out and net that is enforceable in these jurisdictions, the non-defaulting party's ability to include the unconfirmed transaction in its close-out netting calculation would be jeopardised. This would be the case even if the parties have executed a valid master agreement. Whether the non-defaulting party can close out and net depends not only on the enforceability of the master agreement but also on the enforceability of the outstanding transactions covered by the master agreement.

There are, however, jurisdictions that enforce oral contracts. In these jurisdictions, the failure to confirm a transaction in writing would not make a transaction that is otherwise valid and binding unenforceable. Therefore, assuming that there is an enforceable master agreement, it would not jeopardise the non-defaulting party's ability to include the transaction in its close-out netting calculation. Nonetheless, there can be disputes over the terms of the transaction, and such disputes can jeopardise the non-defaulting party's ability to include the transaction in its close-out netting calculation. Hence, even in those jurisdictions that enforce oral contracts, written confirmations serve an important evidentiary function. This evidentiary function is likely to be especially important for those transactions that go unconfirmed for many months, given the typical market practice of retaining tapes only for six months.

Quantitative measures of market risk and credit risk are only as good as the transactions data on which they are based. As reported in Section 5, discrepancies between dealers' confirmations of transactions relate mostly to terms of minor importance. Nevertheless, a failure to confirm a transaction can allow material errors in a firm's records of its transactions to go undetected, and this may result in market risks or counterparty credit risks being substantially underestimated. The significance of this problem depends upon the nature of the error and the type of transaction involved. This risk is perhaps greatest for transactions with errors in the quantitative terms of deals, particularly transactions for which errors could go undetected the longest, for example long-dated forwards that do not provide for a payment to be made or received for several years. An industry survey conducted recently by the Group of Thirty also indicated substantial concern over the quality of information fed into risk monitoring systems, both market risk data and counterparty credit risk data.[34]

In the short run, firms can mitigate the risks associated with outstanding confirmations by enhancements to their internal systems for capturing trade data and generating confirmations and by monitoring the backlog and appropriately prioritising efforts to reduce it.[35] In the longer run, efforts to standardise and electronically match confirmations or to develop front-end trade matching systems may prove even more effective, although thus far such efforts have produced only limited progress.

As discussed in Section 5, the capture of data on OTC transactions and preparation of confirmations remains a manual process at many firms. Dealers typically embrace the goal of "straight-through processing", that is, the capture of trade details directly from front-end trading systems and complete automated processing of confirmations and settlements without the need for rekeying or reformatting data. However, while some dealers have achieved this goal for plain vanilla transactions (FRAs, interest rate swaps), few, if any, have achieved it for highly structured transactions. Progress towards this would reduce outstanding confirmations, both by speeding their preparation and by avoiding the inevitable errors associated with manual processing.

Even if a dealer promptly dispatches accurate confirmations, the transactions may remain unconfirmed, either because the counterparty prepares its own confirmation which does not match the dealer's, or because the counterparty simply does not respond to the dealer's confirmation. In such circumstances, the backlog of outstanding confirmations may nonetheless be reduced by many of the

---

[34] See Group of Thirty (1997), p. 14. To be fair, it is not entirely clear that the concern focuses solely or even primarily on OTC derivatives transactions.

[35] In addition, one dealer reported that its efforts to control risks associated with outstanding confirmations were helped by calling the back office of the counterparty to verify the terms of the trade on the trade date.

same practices that are effective for reducing backlogs of unsigned master agreements. First, it is essential to establish an internal tracking system that monitors the status of each confirmation and produces reports on outstanding confirmations for distribution to credit officers and senior management. Secondly, efforts to resolve outstanding confirmations should be prioritised on the basis of indications of the risks posed - counterparty credit rating, current market value of the transactions and nature of the apparent disagreement with the party, especially whether it involves material economic terms of the transactions. Thirdly, responsibility for resolving outstanding confirmations should be assigned clearly, preferably to a special department independent of the trading function. That department needs to be provided with adequate resources and to be able to call upon traders and relationship managers for assistance with counterparties when necessary.

Even if a dealer adopts the most effective internal policies, however, significant delays in confirming some transactions are likely to persist until confirmations are standardised and automated systems for issuing and matching confirmations become available. One possible route to standardisation and automation is the use of S.W.I.F.T. templates, which are based on the ISDA templates, and S.W.I.F.T.'s Accord matching service. As mentioned in Section 5, S.W.I.F.T. has established messages for confirming the more standardised types of OTC transaction, and its Accord system may be used to match confirmations for FRAs, interest rate swaps, caps and currency swaps. Dealers with a S.W.I.F.T. interface are able to send the details of the trade, and S.W.I.F.T. makes an electronic comparison with the details sent by the counterparty and sends back reports as to whether the trade has been matched or, if not, what the exceptions are. In addition, a similar service for sending confirmations and matching them electronically is being developed by Londex International.[36]

For dealers that trade plain vanilla products, use of such electronic matching services would enable them to shift resources previously used on transactions eligible for electronic matching to the more complicated trades that are most difficult to confirm, and thus to speed up the confirmation process as a whole. Electronic confirmation matching would reduce risk by shortening the lag between the execution of a trade and the discovery of a disagreement over its terms. Some dealers see limitations in electronic matching, however. It would not be cost-effective to develop an interface between the matching system and their derivatives back office systems unless this system can attain critical mass. Moreover, the benefits gained from the use of electronic matching could be limited if the system is not able to handle swaptions, bond options, equity derivatives, and other structured products that make up a significant portion of derivatives portfolios at some dealer institutions. Dealers would continue to need a separate system for the confirmation of transactions with counterparties or products not covered by electronic matching.

Dealers said that S.W.I.F.T., the only electronic service available currently, has some of these limitations. Most of the dealers interviewed are therefore exploring various alternatives or supplements to S.W.I.F.T. Accord.[37] However, to date most other confirmation matching services appear not to have made it beyond the drawing board.[38] Some dealers expressed the view that confirmation backlogs will remain a problem unless a system is developed that enables matching of terms when the deal is struck. However, such a system might have some of the same limitations as a back office confirmation matching system (for example, end-users seem unlikely to invest in such a system). Furthermore, the costs of developing such a system might be so high that it could not proceed without a critical mass of dealers, which is always difficult to achieve.

---

36 Additional information on S.W.I.F.T. and Londex International is provided in Annex 4.

37 ISDA has recently requested proposals for automated trade matching services for confirmations and for collateral from vendors. ISDA outlined the standards its members felt such systems should meet. Several vendors responded with descriptions of services. ISDA members are pursuing the possible use of the systems individually with the vendors.

38 Austraclear Ltd. provides depository clearing and settlement services for the Australian money market. The Austraclear system provides electronic matching for swaps, but dealers still confirm trades using paper-based systems because the matching routine does not cover all the terms of deals. Also as discussed in Annex 4, OM Stockholm provides electronic matching for certain OTC derivatives transactions in Sweden.

Rapidly expanding use of collateral

The increased use of collateral can significantly reduce counterparty credit risks and thereby enhance the stability of the OTC derivatives markets. Nonetheless, the use of collateral does not eliminate credit risk and may entail other risks: liquidity, legal, custody and operational risks. If these risks are not managed effectively and dealers use the collateral agreements to free credit lines and capital and enlarge their business, counterparty risks may actually increase.[39] This subsection will consider the effects of collateral agreements on each of these risks. It concludes with an evaluation of whether the collateralisation of OTC derivatives poses any systemic threats.

Credit risk. OTC derivatives transactions typically entail replacement cost risk, that is, the risk that a default by a counterparty will require the non-defaulting counterparty to incur a cost to replace the contract or a portfolio of contracts. This credit risk has two components: the probability of default and the potential loss in the event of default. A collateral agreement is commonly analysed as affecting the potential loss in the event of default. Recall that, in the absence of collateral, the current exposure equals the market value of the derivatives contract (if positive) or zero (if the market value is negative). When a portfolio of derivatives is collateralised, the effect on the current exposure is relatively straightforward. It is equal to the difference between the net value of the contracts and the value of the collateral held (if positive) or zero (if the value of the collateral equals or exceeds the value of the contracts).[40] By contrast, the assessment of potential future exposure of a collateralised portfolio can be quite complex. It depends not only on the potential future market values of the contracts, but also on the potential value of collateral called for and held. Potential future exposure under a collateral agreement also depends critically on the correlation between the market value of the contracts and the market value of the collateral that must be provided. The correlation will depend on the specific parameters of the collateral agreement - the frequency of revaluations of contracts and collateral - and the parameters that determine the potential size of the uncollateralised exposures on revaluation dates (thresholds, minimum transfer amounts).

The ISDA credit support annex provides for periodic revaluations and recalculations of rights to collateral, usually with a lag of two days between a revaluation and delivery of any required collateral.[41] Furthermore, dealers report that tolerances for uncollateralised exposures have been diminishing, even for many highly creditworthy counterparties. Thus, the structure of collateral agreements tends to limit the potential for collateral values to fall significantly short of contract values. Nonetheless, the potential for uncollateralised exposures is not eliminated, even when the dealer takes full advantage of its rights under the collateral agreement.

In one respect, collateral agreements alter fundamentally the analysis of replacement cost credit risks. In the absence of a collateral agreement, a counterparty has no current exposure if the market value of the contract (or portfolio of contracts) is negative. However, if the counterparty whose contracts have a negative value has provided collateral to the other counterparty, it may be exposed to loss if the counterparty defaults. Specifically, it can be exposed if: (1) the value of the collateral provided exceeds (in absolute value) the negative market value of the contracts; and (2) the collateral provider is not able to recover excess collateral from the defaulting counterparty.[42] In such circumstances, if the collateral taker defaulted on its obligation to return the collateral, the collateral provider would close out the derivatives contract and offset the amount owed to the collateral taker

---

39 The Basle Capital Accord requires that capital for an OTC derivatives contract be calculated as: the sum of the current market value of the contract plus an add-on factor (the add-on factor is a percentage of the notional amount of the contract, the percentage varying by product); this sum is multiplied by a risk weighting factor, reflecting the credit quality of the counterparty, and by the 8% minimum capital requirement. Under certain conditions, credit exposures that have been collateralised receive a zero risk weight. These conditions include restrictions on the types of collateral that can be posted and the frequency of collateral adjustments.

40 However, as discussed below, if the collateral agreement is a two-way agreement, a counterparty may be exposed to losses from a default even if the market value of the contract or portfolio of contracts is negative.

41 Some of the national agreements have credit support annexes that work in a similar way.

42 This might be the case if the defaulting counterparty has reused the collateral.

against the value of the collateral. However, by hypothesis, the collateral provider's liability on the contracts would be smaller than its claim on the unreturned collateral, so it would be exposed to loss. Thus, analyses of credit risks on collateralised OTC transactions need to cover this possibility. In general, the risk of credit losses to the collateral provider is smaller, the larger is the threshold that applies to it and the more frequent are collateral calls.[43] The risk is most significant in those exceptional cases in which the agreement requires the collateral provider to post initial margin.

Liquidity risk. Collateral agreements also expose the counterparties to liquidity pressures. On a day-to-day basis, if the market values of a counterparty's contracts decline, it may be called upon to deliver collateral. How these pressures are met is likely to depend on the nature of the counterparty's business and the structure of its collateral arrangements. OTC derivatives books of dealers tend to be relatively balanced. As collateral agreements become more widely employed between dealers and thresholds increasingly are set to zero, dealers that have the right to reuse collateral may be able to meet a substantial portion of collateral demands by using collateral received from other counterparties. However, this requires that the collateral takers have the systems necessary to take advantage of the right to reuse collateral. By contrast, end-users' activities in OTC derivatives are less likely to be balanced and more likely to produce net demands for collateral. Securities borrowing and lending markets (including repos and reverse repos), if available, can be used in situations where the counterparty has sufficient assets overall but lacks assets in the needed category (such as cash or a specific type of government security). In some cases, however, market participants may be forced to liquidate assets quickly, or to borrow cash at relatively high interest rates.

The practice of linking thresholds in collateral agreements to credit ratings, an understandable and appropriate measure for limiting credit risk, can give rise to extraordinary demands for collateral. Specifically, if a counterparty's credit rating is downgraded, its thresholds vis-à-vis its counterparties would be reduced, requiring it to deliver additional collateral to each counterparty for which its contracts with the counterparty had a negative market value larger than the new (lower) threshold. The aggregate demands for collateral could be quite substantial if collateral agreements provided for substantial declines in the thresholds following the downgrade.

Firms can try to anticipate liquidity strains by simulating the effects of potential price moves or credit downgrades on collateral requirements. In the case of potential price moves, dealers can conduct stress tests that estimate potential demands for collateral arising from market volatility and assess their ability to meet those demands in those market conditions. These potential collateral demands can be compared with liquid assets and other liquid resources. Dealers should then take whatever steps are necessary, including modifications to legal agreements and systems needed to reuse collateral, to ensure that they can meet the collateral demands that might emerge. If a firm that is giving collateral considers the effects of a downgrade on the basis of current positions, liquidity pressures can be estimated by adding up changes in thresholds. A consideration of liquidity pressures emanating from a downgrade at some point in the future, however, raises the same issues and difficulties as estimating liquidity pressures from market movements. Assumptions must be made about the future market values of the contracts. Perhaps in part because of these difficulties, some collateral agreements are structured so that declines in thresholds are concentrated in the higher rather than the lower rating categories. The logic behind this is that liquidity pressures are likely to be easier to meet when a rating is relatively high, but they may be quite difficult to meet at lower ratings.

Legal risk. The primary legal risk associated with taking collateral is the risk that the collateral agreement will not be enforceable. Legal due diligence on the enforceability of a collateral agreement (whether involving pledge or title transfer) must encompass an analysis of the relevant laws regarding perfection, priority and enforcement of a security interest (that is, the right to liquidate the collateral upon counterparty default or insolvency).

As an initial matter, the collateral taker must conduct legal due diligence to ensure that the collateral agreement constitutes a valid and binding agreement under the laws of the relevant

---

[43] A high minimum transfer amount also makes it less likely that a collateral giver would be exposed to credit losses. But a high minimum transfer amount also limits the occasions for the collateral giver to retrieve excess collateral.

jurisdictions.[44] The collateral taker also needs to determine which law governs the creation, perfection and priority of a security interest, and whether the applicable law imposes any technical requirements that must be met to make the security interest enforceable - such as taking possession of the collateral, registering a security interest with a registrar or, if collateral is held by a custodian, ensuring that the collateral is segregated from the custodian's own assets. The collateral taker must then take steps to comply with such technical requirements. These requirements are prescribed in most jurisdictions and thus may not be subject to the choice of the parties. Failure to comply with such technical requirements would make the security interest unenforceable and, therefore, the benefits of collateral illusory.

In addition, the collateral taker needs to review the laws governing the collateral provider's insolvency and determine whether, and the extent to which, it can enforce its security interest in the collateral upon the collateral provider's insolvency.[45] Issues that need to be considered include: (1) whether the collateral taker would be able to quickly liquidate the collateral, or whether it would be subject to a stay; and (2) whether it would be forced to share the collateral with other creditors of the collateral provider (for example, its employees).

As discussed in Section 5, collateral agreements frequently provide for reuse of collateral by the collateral taker either because they transfer full ownership to the collateral taker or, if the collateral agreement is structured as a pledge, because they enable the collateral giver to permit the collateral taker to rehypothecate the collateral. The ability to reuse collateral enhances earnings and liquidity by giving the collateral taker added flexibility and saving it the cost of acquiring collateral if the collateral taker is itself obligated to provide collateral to another. Before reusing the collateral, however, the collateral taker would need to conduct legal due diligence and assess whether such action would jeopardise its interest in the collateral. The provider, in turn, would need to conduct legal due diligence and assess the extent to which it would assume additional credit risk by permitting the collateral taker to reuse the collateral. Issues to be considered include: (1) whether, notwithstanding reuse, the collateral taker could set off the value of the collateral against the amount owed by the collateral provider upon the provider's default or insolvency; and (2) whether the collateral provider can set off the value of the collateral provided against the amount owed to the collateral taker if the collateral taker reuses the collateral and subsequently defaults or becomes insolvent.

The same issues outlined above need to be considered in assessing the enforceability of a cross-border collateral agreement. However, a cross-border collateral agreement raises more complex legal issues, and legal certainty as to its enforceability may be difficult to obtain. The primary difficulty in assessing the enforceability of a cross-border collateral agreement is determining the law that governs the perfection (that is, enforceability against third parties) and priority of a security interest. This is because many jurisdictions may claim to be competent to hear disputes relating to the collateral arrangement, particularly if collateral consists of book-entry securities held in multi-tiered chains through one or more custodians or settlement systems. Such jurisdictions may include, for example: (1) the jurisdiction(s) where the parties are incorporated or located which have insolvency jurisdiction over the parties; (2) the jurisdiction whose law governs the collateral agreement; and (3) the jurisdiction where the collateral is "located", which may be the jurisdiction where each custodian is located or where the issuer is located.

Once the relevant jurisdictions are identified, the collateral taker needs to review the laws of these jurisdictions to determine which law governs the enforceability of the collateral agreement. In this regard, many jurisdictions apply the law of the jurisdiction in which the collateral is located to determine whether a collateral agreement is enforceable (lex situs rule). However, even if every jurisdiction that may be competent to hear disputes over a collateral agreement follows this rule, the analysis does not end. This is because each jurisdiction may reach a different conclusion as to where

---

44 As with any contract, this entails, among other things, review of the counterparty's capacity and authority to enter into the collateral agreement and to provide collateral and perform other obligations under the agreement.

45 There can be insolvency proceedings in multiple jurisdictions if the collateral provider has offices or assets in more than one jurisdiction.

the collateral is located, particularly if the collateral is immobilised or dematerialised securities held in multi-tiered chains. Moreover, each jurisdiction identified as the location of the collateral may have different technical rules for perfecting security interests. Because of the difficulty of determining the applicable law, the most prudent course of action would be to comply with the technical rules of all jurisdictions identified as the location of the collateral. However, complying with all these requirements may be expensive or impossible.

In some jurisdictions, there are laws providing that an interest in securities and the enforceability of pledges and charges taken over them are governed by the law of the country where the account in which the securities are held is located, whether the account is held with a depository or intermediary. This is the case in the United States, where Treasury securities (assets which are frequently provided as collateral against OTC derivatives exposures) are held, and in Belgium and Luxembourg, where Euroclear and Cedel are located. This principle is also set out in the EU directive[46] on settlement finality in payment and securities settlement systems (although the directive applies only to secured creditors in the context of participation in a payment or securities settlement system located in the European Union and to EU central banks).

Operational risk. The administration of collateral agreements requires the development of complex information systems and a variety of internal controls. Consequently, operational risk is very significant in collateral programmes. As discussed in Section 5 and described in Annex 3, collateral agreements typically require the daily revaluation of all transactions documented under a master agreement as well as all collateral held or pledged. Amounts of collateral to be received or delivered must then be computed, taking into account various parameters of the collateral agreements, for example thresholds and minimum transfer amounts. Further complications arise from provisions that allow the substitution or reuse of collateral and from the potential for disputes about valuations or requests for waivers of collateral calls.

Each of these elements of collateral agreements requires reliable systems and internal controls to ensure that credit risk is mitigated as intended. If systems fail to capture all transactions covered by a collateral agreement, if transactions are valued inaccurately, or if collateral is valued inaccurately, a dealer may fail to call collateral when it is entitled to do so. Capturing and valuing all transactions covered by a collateral agreement may be difficult because of the many products and numerous geographical locations covered by the agreement. Furthermore, if systems fail to record the terms of collateral agreements accurately or to compute accurately the implied claims or obligations with respect to collateral, insufficient collateral may be called. If collateral substitution is permitted, the collateral taker must ensure that the new collateral is received before (or at the same time as) the old collateral is released.[47] More generally, collateral holdings must be monitored constantly to ensure that collateral is received when demanded.[48] Reuse of collateral requires very sophisticated systems to track the obligations to return collateral and ensure that those obligations are met on schedule. When disputes about valuation occur, a dealer must have procedures in place to ensure that they are resolved as promptly as possible. Finally, counterparties may on occasion ask for waivers of requirements to deliver collateral. If such waivers are to be granted, policies should be implemented that indicate clearly whose authority - for example, a credit officer's or a senior manager's - is required to grant a waiver.

The functioning of the internal controls identified above is critically dependent on various hardware and software systems. The reliability of these systems is thus an important issue. Backup facilities are generally necessary to ensure prompt recovery from technical problems or breakdowns. Another common element essential to the effectiveness of key controls is good communication and close cooperation among various departments, including the front office (traders and marketers) and credit, legal, operations, custody and risk management functions. To avoid operational failures, the

---

46 Directive 98/26 EC of the European Parliament and of the Council of 19th May 1998.

47 The implementation of DVD (delivery-versus-delivery) mechanisms in securities settlement systems can eliminate this risk.

48 In some securities settlement systems, care must be taken that collateral received has been irrevocably transferred.

responsibilities of the various parties must be clearly defined and mechanisms must be developed to ensure that the necessary cooperation is forthcoming.

While the administration of collateral agreements poses formidable operational challenges, implementation of the systems and internal controls that are needed to meet those challenges can result in very significant enhancements to counterparties' risk management capabilities. In particular, both market risk and counterparty credit risk management are critically dependent on timely, accurate valuations of OTC derivatives. Collateral agreements typically require counterparties to mark derivatives contracts to market daily. They also provide additional incentives for prompt confirmation of transactions since disagreements about the terms of trades, if material, can produce disputes about portfolio valuations. Finally, and perhaps most importantly, the daily comparison of portfolio values provides an external validation of the internal valuations of transactions.[49] Sizable losses, such as those several firms have suffered in recent years because of misvaluations of complex OTC options, would be less likely to occur if transactions were collateralised, because the counterparties would dispute the erroneous valuations.

Custody risk. Finally, collateral agreements may give rise to custody risk, that is, the risk of loss of securities received from counterparties and held in custody because of insolvency, negligence or fraudulent action by the custodian. Some derivatives dealers seek to reduce custody risk by holding any securities in their own account at a central securities depository. Where a custodian is used, the key to avoiding losses from custody risk is often the separation (segregation) of the collateral taker's assets from those of the custodian and other dealers. Effective management of custody risk involves an assessment of the reliability of the custodian's internal controls that are intended to ensure separation. The collateral taker should also examine the law governing the custodian's insolvency and ensure that, upon the custodian's insolvency, the collateral taker would be entitled to recover the collateral from the custodian's bankruptcy representative free of any claims by the custodian's creditors.

Systemic risk. Despite the widespread use of bilateral netting, counterparty credit exposures have become a significant source of credit risk to the global financial institutions that are the largest dealers in OTC derivatives. In particular, OTC derivatives are a very significant source of inter-dealer credit exposures. Consequently, if a major global financial institution were to fail, losses to other dealers on OTC derivatives would be a potential channel for the transmission of systemic disturbances. The collateralisation of inter-dealer exposures in principle could greatly reduce the likelihood that systemic disturbances are transmitted through that channel.

However, as noted above, the use of collateral entails other types of risk, including legal risk and liquidity risk, which could in certain circumstances materialise in ways that pose threats to the financial system. With respect to legal risk, there is the risk that in the event of a counterparty's insolvency collateral agreements with the insolvent counterparty might prove unenforceable in one or more relevant jurisdictions.[50] Such a development could result in widespread losses, because many other counterparties might have relied upon the enforceability of the agreements and incurred exposures to the insolvent party that they would have avoided if they had suspected the collateral agreements were unenforceable. Legal due diligence is undoubtedly key to limiting vulnerabilities to this potential source of systemic disturbances. But, as discussed above, the legal issues are complex, particularly in a cross-border context. As in the case of concerns about the legal enforceability of netting, which have been aired thoroughly in previous reports by the G-10 central banks,[51] it is important to identify those jurisdictions in which the enforceability of collateral agreements is

---

49 Typically, counterparties only confirm the net value of their entire portfolio of transactions with each other. Nonetheless, material differences in valuations of individual transactions tend to produce significant differences in calculations of net values of portfolios.

50 General concerns about the enforceability of collateral agreements become comparable to those raised previously about the enforceability of netting contracts.

51 See Committee on Interbank Netting Schemes (1990).

uncertain and to work with legislators in those jurisdictions to reduce legal risk through changes in national law.

With respect to liquidity risks, as the usage of collateral grows, dealers may become more vulnerable to liquidity pressures. As noted above, large changes in market prices could produce sharp swings in the net values of the portfolios supported by collateral agreements which, in turn, could produce significant demands for collateral. Such collateral demands might prove especially difficult to meet in volatile markets, when meeting funds needs becomes more problematic in general.

In summary, the collateralisation of OTC derivatives has the potential to reduce counterparty risks and systemic risks. However, the realisation of these potential benefits is dependent on market participants identifying the liquidity risks, legal risks, operational risks and custody risks that the use of collateral entails and taking the steps necessary to manage those risks effectively.

Clearing houses

As mentioned in Section 5, the clearing of OTC derivatives is currently quite limited. Among the G-10 countries, clearing is significant only in Sweden. OM Stockholm clears both standardised OTC contracts and tailor-made contracts.[52] The London Clearing House (LCH) plans to offer clearing of OTC derivatives to the largest swap market participants, most of which are already LCH members, beginning in 1999. The instruments that it proposes to clear are FRAs and interest rate swaps in several major currencies (including US dollars, sterling, yen and euros) with maturities up to ten years. Only relatively simple instruments would be cleared. Initially, option-type instruments and currency swaps would be excluded, although they may be eligible for clearing later.[53]

A clearing house typically substitutes itself as central counterparty to all transactions that its members agree to submit for clearing.[54] The clearing house's rules invariably provide for bilateral netting of obligations between the clearing house and each of its members.[55] By substituting the clearing house as central counterparty, its members achieve multilateral netting of the obligations in the transactions submitted for clearing. A clearing house's risk management procedures typically include margin requirements that require collateralisation of the clearing house's potential future exposures to its members and either daily settlement (variation margin) or collateralisation of the clearing house's current exposures. In addition to multilateral netting, a clearing house may provide other services, such as matching of trade confirmations or multilateral payment netting.

The creation of a clearing house has the potential to mitigate each of the types of counterparty risk associated with OTC derivatives - credit risk, liquidity risk, legal risk and operational risk.[56] It may also reduce systemic risk, provided that the clearing house itself manages these risks effectively.

Credit risk. Credit risks on OTC derivatives depend on credit exposure (the net market value of the transactions at the time of default) and on the probability of the counterparty's defaulting. Multilateral netting of transactions reduces credit exposures relative to the exposures that typically

---

52 See Annex 4 for a more thorough description of OM Stockholm's clearing of OTC derivatives.

53 Additional information on the LCH's plans is provided in Annex 4.

54 The operations of clearing houses for exchange-traded derivatives, which are quite relevant to this discussion, are described and analysed in Committee on Payment and Settlement Systems (1997).

55 A clearing house's members could include end-users as well as dealers. Furthermore, it could employ a tiered membership structure in which non-members clear trades through members.

56 As is the case with other techniques for mitigating credit risk, the reduction of credit risk could allow dealers to engage in more transactions within a given set of counterparty credit limits.

exist in the absence of clearing.[57] In effect, multilateral netting allows the clearing members to offset their net liabilities to some members against their net claims on other members.[58] Thus, the benefits of multilateral netting tend to increase the broader is the participation in the clearing house. Furthermore, the margining procedures typically used by clearing houses have the effect of eliminating current exposures (or collateralising them) on a daily basis and also reducing potential future exposures.

However, as noted above, clearing houses for OTC derivatives contemplate clearing only relatively simple instruments. Non-cleared transactions will continue to be covered by bilateral netting agreements with the original counterparties, and the bilateral net exposures on those non-cleared contracts may increase to some degree, because the removal of the cleared contracts from the bilateral netting agreements will tend to reduce the potential for positive market value transactions to be offset by negative market value transactions within the portfolios covered by these agreements.

In practice, dealers will seek to quantify the multilateral netting benefits of clearing and the adverse effects of segmenting their bilateral portfolios into cleared and non-cleared segments, and will submit transactions for clearing only if they (and their counterparties) conclude that doing so is in their self-interest. The magnitude of this potential adverse effect of splitting portfolios of transactions with counterparties into cleared and non-cleared segments will vary from dealer to dealer, depending on the range of contracts cleared and the types of transaction in the dealer's portfolio. The wider the range of transactions cleared and the greater the proportion of a dealer's transactions that fit the clearing house's parameters, the less important is the potential adverse effect of segmentation. Furthermore, if the clearing house clears both exchange-traded and OTC products, the benefits of netting across exchange-traded and cleared OTC products might compensate for any adverse effects of segmenting OTC products.

Interest in clearing will tend to be stronger among dealers whose portfolios are dominated by the types of transaction that will be cleared or that have relatively large exchange-traded positions at the clearing house, and weaker among dealers whose portfolios are dominated by non-cleared transactions and that have relatively small exchange-traded positions with the clearing house. Furthermore, for all dealers, the broader the participation by others, the greater will be their interest in clearing, because broader participation will enlarge the benefits of multilateral netting of cleared transactions.

Even if increases in bilateral credit exposures on non-cleared transactions were appreciable, dealers might nonetheless conclude that credit risk had been reduced in the aggregate if the clearing house's probability of default on the cleared contracts is viewed as significantly lower than the average probability of default by the dealer's counterparties. Clearing houses are often viewed as highly creditworthy or even risk-free. However, the financial integrity of a clearing house depends critically on the robustness of the various risk management safeguards employed to manage its risks vis-à-vis its members, and the effectiveness of those controls cannot be taken for granted. The critical importance of risk management safeguards and the need to evaluate their effectiveness apply equally well to clearing houses for OTC derivatives.

However, even if a clearing house for OTC derivatives employs safeguards that make it highly creditworthy (if, realistically, not default-free), dealers may not see much potential for credit risk reduction through clearing. Dealers that employ bilateral netting and collateral agreements with their existing counterparties may already view the credit risks as de minimis, at least if collateral thresholds are low and recalculations of collateral requirements are frequent. Here again, assessments may differ from dealer to dealer. In particular, those dealers that have invested heavily in developing collateral management programmes for OTC derivatives or in using central collateral management

---

[57] The discussion in this section implicity addresses the effects of clearing on current exposure. The effects on potential future exposure are more complex but likely to tend to be similar to the effects on current exposure. Intuitively (and rather simplistically), current exposure is reduced by netting to the extent that values of some contracts have in the past offset the value of other contracts. To the extent that such results have been observed in the past, they are more likely than not to persist in the future.

[58] Thus, if a clearing member's bilateral net positions vis-à-vis all other members are all net claims, multilateral netting does not reduce that member's credit exposure.

systems may see smaller benefits to clearing than dealers (mostly smaller dealers) that as yet have made little or no use of collateral. [59]

Liquidity risk. A clearing house has the potential to reduce liquidity risks to its participants by broadening the scope of payment netting. On the contracts that are cleared, payment netting should be relatively straightforward and would reduce the size of payments needed to settle the cleared transactions. It would thereby reduce the potential for payment delays to produce liquidity pressures, provided that the clearing house itself maintains the liquidity resources necessary to make its payments when due. While the segmentation of portfolios into cleared and non-cleared transactions would reduce the potential benefits of bilateral payment netting, as noted in Section 5, dealers report that most bilateral payments are currently made on a gross basis because of administrative difficulties. Thus, in this area clearing offers unambiguous benefits. However, as noted in Section 5, the value of payments associated with OTC derivatives is small relative to dealers' total payments and, in particular, to the size of payments they make to settle foreign exchange contracts. Consequently, the potential benefits of payment netting for OTC derivatives are correspondingly smaller.

But the clearing of OTC derivatives could affect liquidity risks in other, more complex ways. As noted earlier, clearing houses typically impose margin requirements on their members. Two basic types of margining system are employed: either a clearing house's current exposures are eliminated each day through cash settlements with its members, or current exposures are collateralised with collateral requirements recalculated and collateral calls issued each day. In both systems, a clearing house's potential future exposures to members are collateralised, that is, initial margin is required. In either system, members are exposed to daily (in some cases intraday) liquidity pressures to the extent of any decline in the net value of their contracts with the clearing house. The only difference, as far as liquidity implications are concerned, is the type of asset demanded (government securities and some other assets may also be used in the case of collateralisation). In either system, the submission of new contracts for clearing can produce demands for initial margin collateral.

In this regard, compared with bilateral netting and collateralisation, the effect of the clearing of OTC derivatives on liquidity pressures faced by members of the clearing house is ambiguous. The potential cross-margining of exchange-traded and cleared OTC contracts would tend to ease liquidity pressures. So too would the multilateral netting of cleared OTC positions, although the relative gains would be smaller the more extensively collateral is reused in bilateral collateral agreements. Also, a clearing house's resources would protect its members from the potential liquidity pressures of failure to pay by any one of its members. By contrast, an unanticipated increase in initial margin requirements on cleared OTC transactions could add to liquidity pressures. So too would the loss of bilateral netting benefits from the splitting of OTC portfolios into cleared and non-cleared segments, although here again the adverse effects would be limited depending on how widely collateral is reused.[60]

Legal risk. A clearing house would be likely to reduce legal risks associated with cleared transactions. Specific provisions of national law often support key elements of the clearing house's rules, including its rights to close out its contracts with a defaulting participant, net the gains and losses, liquidate the participant's margin collateral, and apply the proceeds to cover any net losses.[61] For example, the LCH's default rules are protected from challenge in an insolvency under English law by the provisions of Part VII of the Companies Act 1989. Furthermore, members of a clearing house

---

[59] The margining arrangements typical of clearing houses for exchange-traded derivatives are equivalent to bilateral collateral arrangements with a zero threshold and no minimum transfer amount; clearing houses normally transfer collateral on the business day following the call (or in some cases on the same day) rather than two business days as is standard under the ISDA CSA for bilateral arrangements.

[60] In a world in which all transactions (both cleared and non-cleared) are collateralised and all collateral received is reused, the net demand for collateral would equal the net decline in the value of the dealer's portfolio, regardless of the division of contracts between cleared and non-cleared.

[61] Of course, if a clearing house accepts direct membership by firms organised under the law of foreign jurisdictions, the clearing house would also need to review the law of such members' jurisdictions to assess its ability to enforce its rules against such members upon their insolvency.

must invariably enter into a legal agreement to abide by its rules, including the default rules, prior to submitting contracts for clearing, and contracts are accepted for clearing only after matching confirmations have been received from the counterparties. Thus, the legal risks associated with unsigned master agreements and outstanding confirmations for non-cleared contracts almost surely would not arise for cleared transactions.

Operational risk. A clearing house has the potential to reduce operational risks by imposing high standards of operational reliability on its members, and possibly by establishing automated confirmation matching systems or by promoting the use of matching systems established by others. Some clearing houses for exchange-traded derivatives explicitly incorporate standards for operational reliability in their membership requirements. Clearing houses typically impose tight deadlines for the submission of trade confirmations and for meeting margin calls. Compliance with those deadlines is monitored closely on a day-to-day basis. The investments in back offices that members would need to make to meet these requirements could well reduce operational risks on non-cleared transactions as well as cleared transactions. The tight deadlines for confirmations require efficient confirmation matching systems. OM Stockholm operates its own system, while the LCH plans to require its members to match confirmations for cleared transactions using S.W.I.F.T. Accord or another LCH-approved matching system. Here again, these requirements could spur use of automated systems for confirming non-cleared transactions as well as cleared transactions.

Systemic risk. From a systemic perspective, the key issue regarding clearing is how effectively the clearing house manages the risk to which it is exposed.[62] The creation of an exchange-style clearing house concentrates risks and responsibilities for risk management in the clearing house.[63] Consequently, if a clearing house were unable to meet its obligations to its members when due, systemic disturbances could result - the liquidity of financial markets could be impaired, and payment systems and other settlement systems could be disrupted. In the case of clearing houses that clear both exchange-traded and OTC derivatives, a specific concern is that weaknesses in clearing arrangements for OTC derivatives could impair the integrity of those for exchange-traded derivatives.

Clearing houses in the G-10 countries have generally been quite effective in managing their risks.[64] However, those results are not inherent in the structure and functions of the clearing houses, but instead reflect a combination of key risk controls - membership requirements, margin requirements, default procedures and maintenance of supplemental clearing house reserves - and sound money settlement procedures. Furthermore, even when these basic controls are present, their degree of effectiveness may vary.

The key question with respect to the clearing of OTC derivatives is whether it presents any new challenges not posed by the clearing of exchange-traded derivatives. Two factors that may pose such challenges are that OTC derivatives are more difficult to value accurately than exchange-traded derivatives and that the contracts are inherently less liquid. The ability to mark positions to market and the ability to liquidate positions of a defaulting member are critical components of exchange-traded clearing houses' risk management systems.

To be sure, OTC derivatives would need to be valued on the basis of financial models rather than market prices for the contracts. Moreover, for some OTC derivatives (for example, long-dated or deep out-of-the-money options) different dealers utilise different models, which can produce significantly different valuations for the same instruments. However, operators of clearing houses are

---

62 The systemic issues relating to clearing have been discussed in previous reports by the G-10 central banks. The Lamfalussy Report (Committee on Interbank Netting Schemes (1990)) provided a general discussion of systemic risk in multilateral netting systems. The Report on Clearing Arrangements for Exchange-Traded Derivatives (Committee on Payment and Settlement Systems (1997)) provided a more detailed analysis of the centralised approach to risk management that is utilised by clearing houses for exchange-traded derivatives and that appears likely to be used for clearing OTC derivatives.

63 Clearing houses for foreign exchange have designed loss-sharing mechanisms that seek to decentralise risks and risk management responsibilities. However, both OM Stockholm and LCH are traditional exchange clearing houses.

64 See Committee on Payment and Settlement Systems (1997).

quite aware of these potential valuation difficulties and, as a result, plan to clear only contracts for which relatively accurate valuation models are available. Furthermore, it should be noted that clearing houses for exchange-traded derivatives already rely on models for valuing out-of-the-money options and that several clearing houses have for some time cleared exchange-traded "flex options" for which market values must be modelled. These products have been cleared without apparent difficulty. Likewise, OM Stockholm has not encountered valuation problems in clearing tailor-made OTC products.

With regard to the liquidity of OTC derivatives, OTC contracts are likely to remain less liquid, on average, than exchange-traded contracts.[65] Nonetheless, a clearing house could compensate for the likelihood that it will take longer to replace OTC transactions of a defaulting member by imposing somewhat higher margin requirements for OTC contracts or by maintaining larger amounts of clearing house financial resources to cover potential margin deficiencies that would result from delays in closing out OTC contracts.

In summary, the clearing of OTC transactions offers the potential to reduce the various counterparty risks associated with these transactions. However, the widespread use of bilateral netting and the growing use of collateral have lessened the potential for clearing to reduce credit risks to participants. Indeed, some dealers are reluctant to participate in a clearing house, in part because the clearing of plain vanilla OTC products could increase credit risks by splitting portfolios that are currently covered by a single netting agreement into separately netted cleared and non-cleared segments. Nevertheless, some dealers whose portfolio is dominated by OTC products that can be cleared and whose use of bilateral collateral agreements is limited may see significant benefit.

From a systemic perspective, the key issue is whether the clearing house effectively manages its risk. The safeguards that have proved effective in clearing houses for exchange-traded derivatives appear likely to be effective for OTC derivatives as well.

[65] It is important to note that exchange-traded contracts vary greatly in liquidity. When contract terms are near current market terms, the most common OTC contracts may be as liquid as many exchange-traded contracts.

ANNEX 1

Glossary

Back office: the part of a firm that is responsible for post-trade activities. Depending upon the organisational structure of the firm, the back office can be a single department or multiple units (such as documentation, risk management, accounting or settlements). Some firms have combined a portion of these responsibilities, usually found in the back office, particularly those related to risk management, into what they term a middle office function. See front office.

Broker: a firm that communicates bid and ask levels to potential principals and otherwise arranges transactions as agent for a fee, without acting as counterparty in the transactions.

Clearing house: a department of an exchange or a separate legal entity that provides a range of services related to the clearance and settlement of trades and the management of risks associated with the resulting contracts. A clearing house is often central counterparty to all trades, that is, the buyer to every seller and the seller to every buyer.

Close-out: acceleration and termination of a contract prior to its maturity.

Close-out netting: an arrangement to settle all contracted but not yet due obligations to and claims on a counterparty by one single payment, immediately upon the occurrence of one of the defined events of default. See netting and payment netting.

Collateral: an asset that is delivered by the collateral provider to secure an obligation to the collateral taker. Collateral arrangements may take different legal forms; collateral may be obtained using the method of title transfer or pledge. Typically, government securities and cash are used as collateral in the context of OTC derivatives transactions. See pledge and title transfer.

Collateral management service: a centralised service that may handle any of a variety of collateral-related functions for a client firm, including valuation of collateral, confirmation of valuations with counterparties, optimisation of collateral usage, and transfer of collateral.

Confirmation process: the procedure for verifying trade details with a counterparty. This is generally done by exchanging via fax or mail a document (i.e. a confirmation) identifying the trade details and any governing legal documentation and verifying the accuracy of the information provided by the counterparty (i.e. matching).

Credit risk: the risk that a counterparty will not settle an obligation for full value, either when due or at any time thereafter. Credit risk includes pre-settlement risk (replacement cost risk) and settlement risk (principal risk).

Current exposure: the loss that would be incurred today on a contract or set of contracts if a counterparty failed to perform on its obligations. Also known as replacement cost, current exposure is what it would cost to replace a given contract if the counterparty defaulted now. See potential future exposure.

Custody risk: the risk of loss of securities held in custody occasioned by the insolvency, negligence or fraudulent action of the custodian or of a sub-custodian.

Dealer: a firm that enters into transactions as a counterparty on both sides of the market in one or more products. OTC derivatives dealers are primarily large international financial institutions - mostly commercial banks but also some securities firms and insurance companies - as well as a few affiliates of what are primarily non-financial firms. See end-user.

Default: generally, failure to satisfy an obligation when due, or the occurrence of one of the defined events of default agreed by the parties under a contract.

Derivative: a financial contract the value of which depends on the value of one or more underlying reference assets, rates or indices. For analytical purposes, all derivatives contracts can be divided into basic building-blocks of forward contracts, options or combinations thereof.

Early termination option: a contract provision granting either counterparty the option to terminate a contract before its maturity date, sometimes upon payment of a fee.

End-user: an entity that takes derivatives positions for investment or hedging purposes. An end-user often deals only on one side of the market. End-users include banks, insurance companies, pension funds, other financial institutions, non-financial corporations, governments, supranational entities (for example, the World Bank) and high net worth individuals. See dealer.

Event of default: an event stipulated in an agreement as constituting a default. Generally, the occurrence of a failure to pay or deliver on the due date, breach of agreement and insolvency are events of default.

Exchange-traded derivative: a derivative which is listed and traded at an organised market-place. Derivatives exchanges generally provide standardised contracts and central clearing facilities for participants.

Forward contract: a contract in which one party agrees to buy, and the other to sell, a specified product at a specified price on a specified date or dates in the future.

Forward rate agreement: a forward contract on interest rates in which the rate to be paid or received on a specific obligation for a set period of time, beginning at some time in the future, is determined at contract initiation.

Front office: a firm's trading unit and other areas that are responsible for developing and managing relationships with counterparties. See back office.

Haircut: the difference between the market value of a security and its value when used as collateral. The haircut is intended to protect a collateral taker from losses due to declines in collateral values.

Legal risk: the risk of loss because a law or regulation is applied in an unexpected way or because a contract cannot be enforced.

Liquidity risk: the risk that a counterparty will experience demands for funds (or collateral) that are too large to meet when due.

Long-form confirmation: a confirmation that includes key legal provisions from a master agreement. When no master agreement has been executed between the counterparties, use is sometimes made of a long-form confirmation or of a confirmation that incorporates by reference the standard terms of a master agreement.

Market value (replacement value): the cost that would be incurred or the gain that would be realised if an outstanding contract were replaced at current market prices.

Marking to market: the revaluation of open positions in financial instruments at current market prices and the calculation of any gains or losses that have occurred since the last valuation.

Master agreement: an agreement that sets forth the standard terms and conditions applicable to all or a defined subset of transactions that the parties may enter into from time to time, including the terms and conditions for close-out netting.

Master master agreement: an umbrella agreement that provides for close-out netting of transactions governed by different master agreements. For example, where the parties have used separate master agreements to cover different types of OTC derivatives transaction, the parties may enter into a master master agreement in an effort to achieve a greater reduction of credit risk.

Multilateral netting: netting on a multilateral basis is arithmetically achieved by summing each participant's bilateral net positions with the other participants to arrive at a multilateral net position. Such netting is conducted through a central counterparty (such as a clearing house) that is legally substituted as the buyer to every seller and the seller to every buyer. The multilateral net position represents the bilateral net position between each participant and the central counterparty. See netting.

Netting: an offsetting of positions or obligations by counterparties. See close-out netting and payment netting.

Operational risk: the risk that deficiencies in information systems or internal controls could result in unexpected losses.

Option contract: a contract that gives the buyer the right, but not the obligation, to buy or sell an underlying asset by (or on) a specific date for a specific price. For this right the purchaser pays a premium.

Out-of-the-money: a term used to describe an option contract that would produce a negative cash flow for the holder if it were exercised now.

Over-the-counter (OTC): a method of trading that does not involve an exchange. In over-the-counter markets, participants trade directly with each other, typically by telephone or computer links.

Payment netting: settling payments due on the same date and in the same currency on a net basis.

Plain vanilla transactions: the most common and generally the simplest types of derivatives transaction. Plain vanilla is a relative concept, and no precise list of plain vanilla transactions exists. Transactions that have unusual or less common features are often called exotic or structured.

Pledge: a delivery of property to secure the performance of an obligation owed by one party (debtor/pledgor) to another (secured party). A pledge creates a security interest (lien) in the property so delivered. See security interest.

Potential future exposure: the additional exposure that a counterparty might potentially assume during the life of a contract or set of contracts beyond the current replacement cost of the contract or set of contracts. See current exposure.

Pre-settlement risk (replacement cost risk): the risk that a counterparty to an outstanding transaction for completion at a future date will fail to perform on the contract or agreement during the life of the transaction. The resulting exposure is the cost of replacing the original transaction at current market prices. See credit risk.

Risk factor: a variable that affects the value of financial instruments or an entire portfolio. The most common market risk factors are interest rates, foreign exchange rates, equity prices and commodity prices.

Reuse of collateral (rehypothecation): a party's pledging or transferring to another party collateral that was pledged or transferred to it. The term rehypothecation is generally used to refer to pledging collateral that was pledged.

Secured party: a party that holds collateral that secures its claims on a debtor.

Security interest: a form of interest in property which provides that the property may be sold on default in order to satisfy the obligation covered by the security interest.

Set-off: a method of cancelling or offsetting reciprocal obligations and claims (or the discharge of reciprocal obligations up to the amount of the smaller obligations). Set-off can operate by force of law or pursuant to a contract.

Settlement risk (principal risk): the risk that the seller of a security or funds delivers its obligation but does not receive payment or that the buyer of a security or funds makes payment but does not receive delivery. In this event, the full principal value of the securities or funds transferred is at risk. See credit risk.

Straight-through processing: the capture of trade details directly from front-end trading systems and complete automated processing of confirmations and settlement instructions without the need for rekeying or reformatting data.

Swap: an agreement for an exchange of payments between two counterparties at some point(s) in the future and according to a specified formula.

Systemic risk: the risk that the failure of one participant in a payment or settlement system, or in financial markets generally, to meet its required obligations when due will cause other participants or financial institutions to be unable to meet their obligations (including settlement obligations in a payment and settlement system) when due. Such a failure may cause significant liquidity or credit problems and, as a result, might threaten the stability of financial markets.

Title transfer: conveyance of the ownership interest in property from one counterparty to another. Title transfer is used as one of the methods for collateralisation. The title transfer method employs an outright transfer of the ownership interest in property serving as collateral, i.e. the collateral provider transfers title or ownership interest to the assets given as collateral against an agreement that the collateral taker will return the equivalent assets in accordance with the terms of their agreement.

ANNEX 2

Questionnaire

Management of counterparty risks on OTC derivatives transactions

This questionnaire has been developed to provide input to a study of clearing arrangements for OTC derivatives that is being conducted under the auspices of the Committee on Payment and Settlement Systems (CPSS) of the G-10 central banks. The group that is undertaking the study intends to distribute the questionnaire to two or more derivatives dealers in each of the G-10 countries. The questionnaire will be administered through on-site interviews conducted by study group members. Responses by individual institutions will be considered confidential and will not be circulated outside the participating central banks. However, a summary of the responses may be made public.

The range of derivative contracts that are traded over the counter is, of course, quite broad. The primary focus of the questionnaire is on interest rate swaps and related instruments, e.g. swaptions, caps, collars, floors. Nonetheless, where practices differ for other privately negotiated contracts, e.g. equity derivatives, credit derivatives, commodity derivatives, it would be helpful to note the differences. We do not, however, intend to focus on foreign exchange contracts, which have been studied in other CPSS projects.

The study group is mindful that the questionnaire is quite detailed and extensive and is sensitive to the potential burdens on respondents. It wishes to emphasise that written responses to the questions are not required. Rather, respondents are asked to assemble the relevant experts to be interviewed by the study group members. The study group members will take responsibility for recording the answers and will give the respondents an opportunity to review a draft of the completed questionnaire. Interviews will be scheduled to occur at least two weeks (longer if necessary) after receipt of the questionnaire, so as to allow adequate time to consider responses and assemble the relevant staff. Finally, where the questionnaire requests quantitative information, rough estimates will suffice if hard data are not readily available.

A. Documentation

1. How extensively do you use master agreements to document OTC derivatives transactions? With how many counterparties have you completed master agreements? With what percentage of your total counterparties? Of dealers? Of end-users?

2. Are standard form agreements typically used? Which ones? ISDA master agreement? National master agreements? Others? What is the coverage of the agreements in terms of instruments and geographic locations? Who determines when and what types of master agreement should be used? What are the principal considerations?

3. How frequently and extensively are standard form agreements amended (beyond the options explicitly provided for in the standard forms)? What are the principal types of amendment?

4. If more than one master agreement is used to document transactions with a single counterparty, how frequently is a "master master" agreement utilised?

5. Are master agreements completed prior to the booking of transactions with a counterparty? How and when is the group responsible for executing master agreements notified that a master agreement is to be prepared and executed?

6. As of 30th June (or a more recent date if data for 30th June are not available) what was the size of the backlog (number of agreements)? How many of these unsigned agreements had been under negotiation for three months or more? What are the principal reasons for delays in signing master agreements? For how many of those unsigned masters have you inserted key provisions of the master in confirmations?

7. In what respects do you perceive risks to be exacerbated by the failure to complete master agreements before transactions are initiated? For example, could your ability to close out contracts and net obligations in the event of a counterparty's insolvency be jeopardised, thereby exacerbating credit risks? To what extent are the risks mitigated by including key provisions of the master in confirmations?

8. How are backlogs of incomplete master agreements monitored? Are procedures in place to escalate efforts to resolve delays in completing documentation? Have further transactions with a counterparty been suspended because of failure to sign a master agreement? Who makes such decisions?

9. What can be done to reduce documentation backlogs?

B. Transaction processing and internal controls

Trade execution

1. How are trades typically executed? By other means?

2. How often are brokers utilised in OTC derivatives transactions? What role do brokers play? Do they ever act as principals? For what types of transaction are brokers utilised most frequently? Do brokers play a role in post-execution trade processing?

3. If trades are executed over the telephone, are conversations routinely taped? How long are tapes kept?

4. Has a process been established by which traders can ensure that trades fall within credit lines and trading limits?

5. Are reports prepared that allow senior management to review transactions and compare them with limits?

Data capture

6. How are data on OTC derivatives transactions captured by the back office? Is data capture automated (straight-through processing) or must data be extracted from dealer tickets? For what types of contract is data capture automated? How quickly are trade data typically captured?

7. How quickly are trade data reflected in management information systems, including systems for measuring, monitoring and controlling counterparty credit risks and market risks?

Confirmation processing

8. On an average day how many confirmations of OTC derivatives transactions do you prepare? How many do you receive?

9. Which counterparty prepares a trade confirmation? How is this determined? Is it clear which counterparty is responsible?

10. Who prepares your trade confirmations? Who reviews and approves confirmations received from your counterparties? Are the personnel reviewing and approving confirmations independent of the trading room?

11. Is there a standard form for confirmations? To what extent do you use the ISDA templates?

12. How are confirmations communicated? By fax, telex or mail? Via the Internet? Via S.W.I.F.T.?

13. How long after a transaction is executed are confirmations communicated? Is the generation of confirmations automated?

14. How often (percentage of total) are discrepancies detected in confirmations? What are the most common sources of discrepancies?

15. Are controls in place to ensure that the economic terms and conditions indicated in confirmations sent and received match the data captured in trading records? Who verifies that the data match? Are those personnel independent of the front office?

16. How large is the backlog of unreturned confirmations? As of 30th June (or a more recent date if data for 30th June are unavailable) how many days' worth of unreturned confirmations were there, i.e. what was the ratio of outstanding unreturned confirmations to your daily average number of trades? How many unreturned confirmations were for transactions executed three months earlier or before?

17. How do you prioritise efforts to obtain signed confirmations? By the time elapsed since transaction execution or by the size of exposures on the transactions? Who is responsible for clearing the backlog? At what point are efforts to obtain signed confirmations escalated? Have further transactions with a counterparty been suspended because of pending unsigned confirmations?

18. What risks are exacerbated by unreturned confirmations? Legal risks, i.e. enforceability of contract, or credit risks and market risks stemming from inaccurate information in management information systems? Is it possible that rights to close out and net unconfirmed transactions could be jeopardised?

19. How are unreturned confirmations and related risks monitored and measured? Is a log of unreturned confirmations maintained? If so, is it reviewed and analysed by management?

20. How often are pre-confirmation trade notifications (preliminary confirmations) used? To what extent does use of preliminary confirmations mitigate the risks of unreturned final confirmations?

21. How can backlogs of unreturned confirmations be reduced? To what extent will forthcoming changes to S.W.I.F.T. formats allow backlogs to be reduced?

Settlement and nostro reconciliation

22. What is the daily average value of payments made and received in settlement of OTC derivatives transactions? How much larger are such payments on peak dates? In what currencies is payment activity concentrated? Do such payments account for a significant share of your institution's overall payments activity?

23. Are standing settlement instructions established with counterparties? Do confirmations include settlement instructions?

24. How quickly are nostro reconciliations performed? By whom? By personnel independent of the front office? If a nostro agent does not report having received an expected payment from a counterparty, what procedures are followed to resolve the discrepancy?

C. Netting

1. Do master agreements typically provide for bilateral netting of obligations on OTC derivatives transactions? If so, what types of netting? Payment netting? Position netting? Close-out netting?

2. How wide is the scope of netting? Across products? Across branches of your counterparties?

3. What type of legal review of the enforceability of netting provisions is performed? What are the principal issues addressed? Who performs the legal review?

4. How much are counterparty credit exposures reduced by netting? Current exposures? Potential future exposures? In general, how are potential future net exposures measured? How frequently are current exposures and potential future exposures measured?

D. Collateralisation

Usage

1. How extensively is collateral used to mitigate counterparty credit risks on OTC derivatives transactions? With how many counterparties have collateral agreements been concluded? What percentage of counterparties? What types of counterparty? What is the geographical distribution of counterparties?

2. Is the use of collateral growing? How rapidly? Why?

3. As of 30th June (or a more recent date if data for 30th June are unavailable) how much collateral did you hold to support credit exposures on OTC derivatives transactions? How did it compare with your aggregate OTC credit exposures? Current exposures? Total (current plus potential future) exposures? How much collateral had you provided to counterparties to support their exposures to you?

Structure of collateral agreements

4. Is a standard documentation, such as ISDA's, typically used for collateral agreements? When standard documentation is not used, why is it not used? What types of standard documentation are used? How often is the collateral agreement structured as a "pledge"? As a title transfer? How frequently and extensively are standard agreements amended (beyond the options explicitly provided for on the standard forms)?

5. What type of legal review of the enforceability of collateral arrangements is performed? To what extent does the legal review address cross-border elements in collateral agreements? Who performs it?

6. What percentage of your collateral agreements are one-way? What percentage are two-way? With what types of counterparty are one-way agreements used? Two-way agreements?

7. Do collateral agreements typically cover individual transactions or do they cover portfolios of transactions with a single counterparty, e.g. all transactions documented under a single master agreement?

8. What forms of collateral are accepted? Cash? OECD government securities? Other securities? Letters of credit? Other? Is collateral "haircut" to reflect potential changes in value? How are such "haircuts" determined?

9. Do agreements typically require one or both counterparties to provide upfront collateral (initial margin)? Alternatively, do agreements allow uncollateralised exposures, provided that exposures do not exceed a certain amount (a threshold)? What determines the size of initial margins or thresholds? A counterparty's credit rating? Potential changes in the value of exposures?

10. How frequently are exposures and collateral values recalculated? How are the values determined? Who determines the values? Are the staff that determine the values independent of the front office? How are exposures and collateral values agreed with counterparties?

11. If recalculation indicates that additional collateral is required (or that collateral is to be returned to the provider), within how many days is the transfer required to be completed, i.e. what is the "settlement period"?

12. Do collateral agreements typically allow collateral takers to reuse, i.e. to rehypothecate or retransfer, collateral? Routinely, or only with the collateral provider's permission? Approximately what percentage of agreements permit reuse of collateral? In practice, how often do you exercise your rights to reuse collateral?

Risk measurement and control

13. Do you have written policies governing your use of collateral agreements? Who is responsible for drafting the policies and monitoring compliance?

14. What are the effects of collateral on counterparty credit risks? How are those effects measured? Are the terms of the collateral agreement (upfront collateral, frequency of valuations, minimum transfer amounts, cure periods) explicitly incorporated? What is assumed about correlations between collateral values, exposures, default probabilities?

15. Are collateralised exposures subject to counterparty credit limits? For this purpose, how are limits set? How are exposures measured?

16. How is collateral held? Who are the depositories or custodians? What procedures are in place to limit custody and settlement risks associated with taking and providing collateral?

17. Where is collateral held? In your home jurisdiction, your counterparty's jurisdiction, or in the country whose law governs the collateral agreement? What determines this choice?

18. What procedures are in place to ensure that collateral is called for and received when provided for in the agreements? Have you developed a global "collateral management" system that covers all collateralised OTC derivatives transactions? Does the same system cover other collateralised transactions?

19. Do you assess the potential effects of demands for collateral (including returns of collateral taken) on your institution's funding liquidity? Are they quantified? If so, how? If collateral demands exceeded the amount you have available, how would additional collateral be obtained?

E. Other bilateral approaches to credit risk mitigation

1. How frequently are periodic cash settlements used to mitigate counterparty credit risks? Are such settlements periodic (calendar-based) or are they triggered by the size of exposures or by changes in counterparty creditworthiness? Are such arrangements only for individual transactions or for portfolios of transactions?
2. How frequently are early termination options used to mitigate counterparty credit risks? When are such options exercisable? Under what conditions?
3. How frequently are assignments or negotiated terminations used to manage counterparty credit risks? Do assignments require the counterparty's approval? How frequently is such approval given in advance?
4. To what extent are offsetting transactions used to mitigate counterparty credit risks? In particular, have credit derivatives been utilised?

F. Centralised collateral management services

1. Are you familiar with the centralised collateral management services that have recently been offered or are under development (e.g. Cedel's Global Credit Support Service and the CME Depository Trust Company)? What degree of interest do you have in utilising centralised collateral management services?
2. What do you see as the most attractive aspects of these services? Reduced collateral costs through centralisation or standardisation, collateral optimisation, or collateral fungibility? Reductions in operating expenses? Enhanced information on positions and collateral values?
3. What are the principal impediments to the use of these services? Does the degree of standardisation imposed place significant constraints on the structure of collateral agreements? If so, what existing arrangements or practices are not accommodated?

G. Clearing houses (multilateral trade netting)

1. Is a clearing house for OTC derivatives feasible? If so, for what range of products? For what types of counterparty?
2. What would be the principal benefits of a clearing house? Risk reduction? Cost reduction?
3. If reducing risks, which types of risk? Credit risks? If the clearing house did not clear all types of transaction (e.g. only "plain vanilla" transactions), could remaining bilateral net exposures increase significantly?
4. If reducing costs, which costs? Costs of collateral? Capital costs? Back-office costs? How would these costs be reduced?
5. What are the principal potential drawbacks of or impediments to a clearing house for OTC derivatives?
6. What degree of interest do you have in the clearing of OTC derivatives? By existing exchange clearing houses? By new stand-alone clearing houses?

Dealers interviewed

Belgium	BACOB Bank Generale Bank
Canada	Canadian Imperial Bank of Commerce Royal Bank of Canada
France	Crédit Agricole Indosuez Société Générale Caisse des Dépôts et Consignations
Germany	Commerzbank Dresdner Bank
Italy	Banca di Intermediazione Mobiliare IMI Istituto Bancario San Paolo di Torino
Japan	Bank of Tokyo-Mitsubishi Daiichi Kangyo Bank Industrial Bank of Japan
Netherlands	ABN Amro ING Bank Rabobank
Sweden	Nordbanken Skandinaviska Enskilda Banken Swedbank
Switzerland	SBC Warburg Dillon Read Union Bank of Switzerland
United Kingdom	Crédit Suisse Financial Products Lloyds Bank National Westminster Bank
United States	Bankers Trust Chase Manhattan Citicorp J.P. Morgan Merrill Lynch

ANNEX 3

ISDA documentation: general description of the 1992 ISDA master agreement and credit support annex (for collateralisation)

Introduction

The prevailing practice among institutions which engage in OTC derivatives transactions is to enter into a standard master agreement with each counterparty, rather than negotiate legal and credit terms transaction by transaction. In certain jurisdictions these transactions are sometimes covered under local master agreements specifically designed for use in those jurisdictions. However, the standard master agreement most often used is that developed by the International Swaps and Derivatives Association (ISDA), namely the ***1992 ISDA master agreement*** (multicurrency - cross-border). ISDA has also developed a standard document, its ***credit support annex***, which is most commonly used for collateralising counterparty exposures on OTC derivatives transactions.

The following summarises the general structure and selected features of these two documents. It should be noted that the discussion does not aim to examine the enforceability of these documents.

1992 ISDA master agreement

(1) Documentation architecture

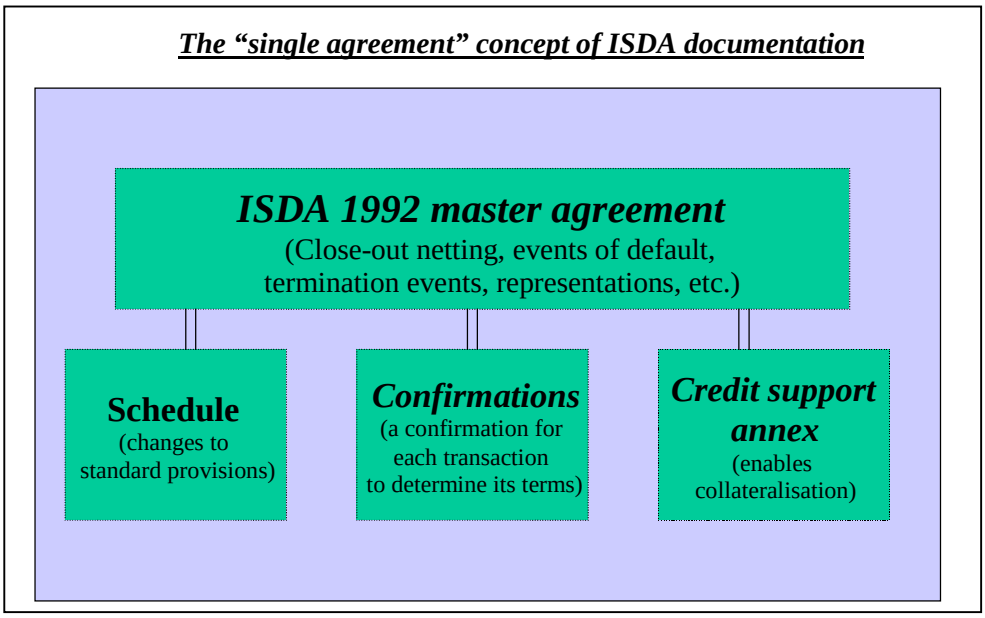
The 1992 ISDA master agreement ("the master agreement") contemplates that all or a defined subset of OTC derivatives transactions between the two parties ("covered transactions") will be governed by the terms and conditions set forth in the master agreement and the confirmations with respect to such transactions. The master agreement consists of two parts: the **body** (i.e. pre-printed form) and the schedule. The body contains the standard terms and conditions that will apply to all covered transactions and the relationship generally, and provides for a number of options. The **schedule** contains the parties' elections with respect to the options contained in the body and other terms that they have negotiated to accommodate their credit, tax and legal concerns. A **confirmation** contains economic terms of a particular transaction and other terms, if any, that the parties have negotiated in connection with the transaction. The master agreement provides that the provisions in the schedule prevail over any inconsistent provisions in the body, and the provisions in a confirmation prevail over any inconsistent provisions in the master agreement.

(2) Benefit and scope

Benefit. One key benefit of using the master agreement is the potential for reducing counterparty credit risk on the covered transactions through close-out netting. Another major benefit is that it reduces the inefficiencies associated with negotiating legal and credit terms transaction by transaction.

Multi-product. The master agreement provides the parties with flexibility as to the types of product that are covered. The parties may either specify that the master agreement covers a single product or, to achieve the maximum reduction in credit exposure, specify a broad range of products.

Multi-branch. Each party can specify that the master agreement governs transactions entered into by one or more offices designated by the party. If multi-branch offices are specified, in the event of default of a specified office, the non-defaulting party may assert a claim against the head office of the defaulting party if so agreed.



(3) Standard terms and conditions

Single agreement. The master agreement establishes that the master agreement and all confirmations of covered transactions constitute a single agreement and that the parties enter into each transaction in reliance on this single agreement concept. Particularly in those jurisdictions that do not have a clear netting statute, this provision seeks to provide the legal basis for the close-out netting of all covered transactions in the event of counterparty default. It is designed to limit the risk that the liquidator, trustee or receiver of the defaulting party will enforce transactions that are favourable to the defaulting party and repudiate the others ("cherry-picking").

Obligation to pay or deliver (including payment netting). The parties are obliged to make the payments or deliveries specified in confirmations. Payments due on the same date and in the same currency under a particular transaction are netted automatically. In addition, the parties may elect to net payments due on two or more transactions.

Events of default. The master agreement defines events of default broadly as including failure to pay or deliver (with a grace period), insolvency and breach of other provisions of the agreement.

Close-out netting. If an event of default occurs and the relevant notices are given, all covered transactions under the master agreement are closed out (accelerated and terminated) automatically[1] or at the option of the non-defaulting party. A "termination (close-out) amount" is calculated for each transaction or group of transactions. This termination amount would be either the mark-to-market value of the transaction ("market quotation method") or would represent the amount of the loss incurred by the non-defaulting party ("loss method") for terminating the transaction. The termination amounts for all transactions are then netted into a single net amount ("net termination amount"), which could be either positive (the non-defaulting party is owed that amount) or negative (the non-defaulting party owes that amount).

Termination events. The master agreement also identifies certain types of event ("termination event") that do not constitute events of default, but nonetheless entitle either party to terminate the covered transactions affected by the termination event. A typical example is a change in law that requires a party to pay an additional tax or makes it illegal to perform obligations.

---

[1] These transactions are deemed to be terminated as of the point in time immediately prior to the default. The parties must specify whether they want automatic termination to apply.

Representations and agreements. The master agreement contains representations and agreements by the parties that are typical for these types of relationship. Among other things, the parties represent that their obligations under the master agreement constitute legally binding, valid obligations and that no event of default or termination event has occurred and is continuing.

Confirmations. The master agreement establishes that the parties intend to be legally bound by the terms of each transaction from the moment they agree to those terms, including oral agreement. The parties are, however, obligated to enter into a confirmation as soon as practicably possible, in writing (including by facsimile transmission) or by an exchange of telexes or electronic messages.

(4) Schedule to the master agreement

Most of the standard terms and conditions in the body of the master agreement are agreed without much modification. Parties use the schedule to make their elections with regard to the options contained in the body and to add other terms that they have negotiated to accommodate their credit, tax and legal concerns. Issues to be negotiated by the parties and documented in the schedule include:

- the law governing the master agreement;
- additional events of default;
- the scope of payment netting (whether it should be broadened to permit netting of payments on two or more transactions);
- whether automatic early termination will apply;
- the method for determining the net termination amount of closed-out transactions (i.e. the market quotation method or the loss method; limited two-way payments (i.e. "walk-away") vs. full two-way payments);
- offices covered and multilateral nature of the parties; and
- additional representations and warranties.

Credit support annex

ISDA has also developed the forms of documentation that are most commonly used for collateralisation. These forms, each of which is commonly referred to as a ***credit support annex (CSA)***, can be used by the parties to the master agreement to further reduce their credit exposure to each other. The CSA is designed to be a two-way collateral agreement.

There are two methods by which the CSA can be used to reduce credit exposure: (1) the **pledge method**[2] (three versions exist: New York law, English law[3] and Japanese law[4]); and (2) the **title transfer method** (under English law). The pledge method reduces counterparty credit risk through the concept of security interest. The party delivering eligible assets ("pledgor") to the counterparty ("secured party") grants a security interest in those assets that the secured party could enforce if the pledgor defaults. The title transfer method, on the other hand, employs an outright transfer of title to eligible assets from the transferor to the transferee. Under the pledge method, the

---

2 All subsequent references in this Annex to the pledge method should be understood to mean the New York law version, which is the version that is most frequently used by major dealers.

3 An English law version of the pledge method is called the "credit support deed".

4 The Japanese CSA is called "loan and pledge" and enables two parties to employ the pledge method as well as the loan method (which is not very different from the title transfer method).

secured party can hold the collateral[5] itself or appoint a custodian to hold the collateral. Unless otherwise agreed, the secured party, so long as it is not in default, may **rehypothecate** the collateral.[6] Under the title transfer method, the transferee, as the owner of collateral, is free to hold collateral directly, and can ***retransfer*** it to a third party subject to an obligation to return equivalent collateral to the transferor.

Basic mechanism for calculation and transfer of collateral. Both the pledge and title transfer methods of the CSA follow the same principles for determining the amount of collateral to be delivered or returned between the parties. If the ***credit support amount*** (see below) exceeds the value of the collateral held by a secured party or transferee on a specified valuation day, the pledgor or transferor is required to deliver additional collateral to cover the margin. If the credit support amount is less than the value of the collateral, the secured party or transferee is required to return the difference in the posted collateral upon the request of the pledgor or transferor. The parties may specify a minimum transfer amount below which either party is not required to transfer collateral.

Calculation of credit support amount. The net termination amount[7] of all transactions under the master agreement will be determined at regular intervals specified by the parties. In order to calculate the credit support amount, the parties calculate the net termination amount, add or subtract negotiated cushions of the parties,[8] and subtract the pledgor's or transferor's pre-negotiated threshold amount.[9]

Other selected negotiated terms. The CSA specifies terms that are negotiated by the parties, including: (1) the types of collateral acceptable to each party ("eligible collateral")[10] and the valuation percentage ("haircut") for each type of collateral; (2) how frequently, and at what time, the transactions under the master agreement and the collateral posted would be valued, and by whom; and (3) whether a party would be permitted to rehypothecate or retransfer posted collateral.

Notification. The party entitled to receive collateral notifies its counterparty of its calculation. If notification is made within the time agreed by the parties, the counterparty is required to deliver or return collateral by the end of the local business day following the notice date, unless otherwise agreed. If the party notified fails to transfer collateral by that time, the party calling collateral delivery or return must give notice of that failure; the party notified then has a further two business days to transfer the collateral before it constitutes an event of default.

Events of default and remedies. Under the pledge method, the pledgor's failure to provide collateral constitutes an event of default that could result in the close-out of all covered transactions. If an event of default with respect to the pledgor occurs and results in the close-out of all outstanding transactions, the secured party settles all transactions on a net basis. The secured party can then set off any amounts payable by the pledgor to the secured party against the value of any collateral provided by the pledgor, or against the liquidation proceeds of such collateral. However, if an event of default with respect to the secured party occurs, the secured party is obligated to return all posted

---

5 For the purpose of this report, the term "collateral" covers assets whose ownership is transferred outright as well as assets that are pledged. See Annex 1.

6 Rehypothecation is not allowed under the credit support deed governed by English law.

7 This is the amount that one party would be required to pay to the other if all covered transactions under the master agreement were terminated and a termination payment were calculated in accordance with the close-out netting provisions in the master agreement (see the above description in this Annex).

8 This cushion is referred to as the "independent amount" in the CSA. Each party could specify an independent amount for the other party in order to protect against potential future exposures.

9 Each party could specify a threshold amount for the other party, referred to as the "threshold" in the CSA. It reflects the level of unsecured credit risk that each party is willing to assume on all outstanding transactions under the master agreement.

10 Typically government securities and cash are utilised as collateral.

collateral to the pledgor.[11] If the posted collateral is not returned, the pledgor may: (1) set off any amounts payable by the pledgor to the secured party against the posted collateral; or (2) withhold payment of any remaining amounts payable by the pledgor to the secured party up to the value of the unreturned collateral held.

Under the title transfer method, if an event of default with respect to either party occurs which results in the close-out of all outstanding transactions, the amount equal to the value of the assets held by the transferee on the early termination date is deemed to be an unpaid amount due to the transferor (which may or may not be the defaulting party). This amount is then included in the calculation of the net termination amount under the master agreement.

[11] The secured party's failure to return excess collateral to the pledgor is defined as an event of default under the master agreement that can result in the close-out of covered transactions.

ANNEX 4

Details of new and existing services offered to market participants

A wide range of services is offered to the OTC derivatives markets to facilitate the trading and settlement of transactions. This annex lists six services and their providers that have been mentioned by market participants as potentially significant: two matching services, two collateral management services and two clearing services. Both existing services and planned new services are covered. The Study Group does not endorse the use of any of these particular services, but does encourage market participants to evaluate the potential advantages and disadvantages of these and any comparable services.[12]

1. S.W.I.F.T. (Society for Worldwide Interbank Financial Telecommunication)

S.W.I.F.T. is a major provider of secure messaging services for use in interbank communications. Its services are extensively used in the foreign exchange, money and securities markets for confirmation and payment messages. S.W.I.F.T. has been upgrading the services it provides for banks in the OTC derivatives market. Its services in this market are similar to those for the forex and money markets. It establishes standards for messages that can be used to confirm transactions to counterparties via the S.W.I.F.T. network. It provides a matching service called "Accord", which receives messages from the two counterparties to a transaction, identifies where the fields match (or fail to match) and reports back.

In the OTC derivatives market, there are standard messages for confirming a range of transaction types: FRAs (message MT340), single-currency interest rate swaps (MT360), cross-currency interest rate swaps (MT361) and foreign currency options (MT305). There are also messages for FRA settlement confirmation (MT341) and interest rate swap reset or advice of payment (MT362). The content of the MTs360-2 messages has recently been revised to refer more closely to the detailed terms and definitions of the ISDA master agreement and new messages have been created for interest rate swap terminations and recouponing (MT364 and MT365). These messages are approved by ISDA for transactions governed by its agreement. Most message fields cover the economic terms of the contract (rates, duration, reset dates, etc.), but messages can also be used to indicate whether an ISDA master agreement is being used.

S.W.I.F.T. has recently enhanced the Accord service to match most existing messages for OTC derivatives (MTs305, 340, 341, 360-6). The objective of Accord is to reduce the volume of confirmations that have to be manually matched. It works by taking copies of the confirmation message of each party to a transaction and checking first on the integrity of the data (e.g. to ensure no fields are missing) and second on whether fields match. Users select the counterparties and the types of transaction that they want to have matched in Accord. If the messages match, S.W.I.F.T. sends a matching report back to both counterparties. Reporting from Accord is as frequent as the user requires but at least once daily. It also reports on "mismatched" messages - where the two messages are almost but not exactly matching (the mismatches are in secondary fields). All unmatched transactions are reported back to counterparties at least daily.

S.W.I.F.T. is developing new message standards for collateral transactions, to be implemented within the next two years. These will enable participants to use S.W.I.F.T. to notify counterparties or collateral management agents of exposures and to make collateral calls. They will also be used to exchange details of portfolios of transactions and changes in net mark-to-market

[12] It should be noted that these services are constantly evolving. This annex is based on the information available as of July 1998. There are reportedly a number of other comparable services under consideration, including one offered by a national central securities depository.

values. Accord will be used to provide deal matching and reconciliation of the mark-to-market values of each counterparty.

2. Londex International: OPEX

OPEX (Open Exchange) is a confirmation matching and collateral reconciliation service being developed by Londex International Limited, a subsidiary of the systems design and operations group SNS Systems Inc. Its launch is planned for autumn 1998.

OPEX will offer two main services to subscribers: trade matching and collateral reconciliation. It will match confirmation messages sent between dealers according to tolerances agreed by dealers. It will also enable subscribers to send documents, either in conjunction with a confirmation or separately. The recipient will not be able to amend the document received, but will be able to agree or suggest amendments electronically across the system. The system will enable pairs of users to create their own confirmation message formats, on a bilateral basis. There will also be a series of standard messages, but subscribers will be able to copy and adapt these. The users will be provided with dedicated software that will enable them to create the new message types and to convert transaction data from the format in which they are kept in internal systems to the format to be used for matching at Londex. The system will then match the message format as well as message content.

The system will also provide for collateral reconciliations - both of the individual transactions covered by a collateral agreement and of the mark-to-market value of each trade. There will be scope for matching on the basis of agreed tolerances. Collateral matching will be possible on an automatic basis (e.g. where counterparties have agreed to match each day at a specific time) or on a manual basis, enabling them to match as often as they choose, including matching the whole portfolio or parts of the portfolio more than once intraday.

3. Cedel Bank: Global Credit Support Service (GCSS)

Global Credit Support Service (GCSS), launched in September 1996, is Cedel Bank's current collateral management service for the OTC derivatives markets. (Cedel Bank plans to replace the service with a new facility, offering collateral management services across a range of products, from the start of 1999.)

GCSS has been established as a fiduciary structure under Luxembourg law. Each participant is required to sign a standard GCSS fiduciary agreement with Cedel Bank that covers all the operating arrangements with counterparties in GCSS as well as to sign a bilateral agreement (e.g. a brief addendum to the CSA to the 1992 ISDA master agreement between two parties). Under the fiduciary agreement, a GCSS participant transfers assets from/to its GCSS account to/from the fiduciary (Cedel Bank). All cash and securities lodged in GCSS are held in the GCSS's omnibus account at Cedel Bank. Transfers into and out of GCSS are made through Cedel Bank's clearing and settlement system using its normal depositories and cash correspondents.

In GCSS, collateral management operates on a bilateral basis. The counterparties agree on the type of collateral agreement they require (including whether it is one-way or two-way), the types of eligible asset, haircuts, the frequency of GCSS operation, whether to make use of the system's optimisation cycle for movements of collateral, the reusability of collateral and certain parameters such as threshold amounts and minimum transfer amounts. GCSS accepts a range of assets including fixed income securities, equities and cash as collateral.

GCSS participants calculate their bilateral net exposures and send the information to Cedel Bank. The system then calculates the collateral amount to be transferred, referring to the terms of the agreement between the parties. Deliveries may be executed in real time. Alternatively, collateral may be moved in the daily batch processing cycle. Where participants have a net positive collateral

position and collateral can be reused, GCSS will make use of collateral received by a participant for the settlement of other transactions, including repos, securities lending or sales outside GCSS.

4. Euroclear: Integrated Triparty Derivatives Support (ITDS)

This new service, launched in 1997, is one of a series of settlement-integrated collateral management arrangements developed by Euroclear for different markets, including repo and securities lending. ITDS is designed to facilitate the collateralisation of net exposures resulting from OTC derivatives transactions.

A Derivatives Service Agreement is executed between two parties, both of which must be Euroclear participants, and the Morgan Guaranty Trust Company of New York, Brussels Office (MGTC), acting as collateral agent. The collateral taker is required to open a segregated collateral account at Euroclear for holding collateral taken from a counterparty under the ITDS agreement. Where the underlying agreement between the counterparties creates a security interest over collateral taken, this account is labelled a "pledge account" to conform with Belgian law. The Derivatives Service Agreement authorises MGTC to transfer cash or securities from the respective account of a collateral giver to the segregated collateral account of the collateral taker. Counterparties agree between themselves whether both or only one side will provide collateral (i.e. whether the agreement is unilateral or bilateral), and whether there will be a threshold or independent amount. They also agree the range of eligible collateral, the haircuts of collateral and limits, if any, on the minimum amount of securities to be transferred and on the maximum amount of any type of securities to be transferred. Collateral accounts may be accessed by either party to the agreement.

Under the Derivatives Service Agreement, the two parties can request MGTC to calculate the amount of collateral to be transferred (the credit support amount), based on data for current net exposures reported by the two parties and on the terms of the agreement (e.g. the threshold); on receipt of the collateral taker's and collateral giver's notifications indicating their net credit exposures, MGTC matches them, calculates the credit support amount and notifies both sides. Alternatively, the two parties may agree the credit support amount and notify MGTC, which then matches the two notifications.

Parties may choose to deliver securities collateral in manual or automatic mode. In a manual transaction, MGTC informs both parties of a collateral deficit or excess and the collateral giver must provide the list of securities it wishes to deliver. MGTC sends a confirmation report to both parties, confirming the description and quality of the securities for which instructions will be entered in the overnight securities settlement processing. In an automatic transaction, eligible securities to be debited or credited to a collateral giver's account are selected and delivered automatically by MGTC during the overnight process. The collateral is selected automatically according to the predetermined algorithm including currency (currency of the net exposures is given first priority), rating and types of issuers.

ITDS also allows exchanges of securities (substitutions). These can be settled on either a delivery-versus-delivery (DVD) or a delivery-versus-payment (DVP) basis. In an automatic transaction, exchanges are automatically triggered, for example when the securities no longer meet the eligibility criteria or when the securities have been specifically excluded by the collateral giver. ITDS also includes custodial services; for example, payments on fixed income securities held as collateral under an ITDS agreement will be automatically transferred to the collateral giver.

5. OM Stockholm

OM Stockholm (OM) operates a centralised clearing system for both exchange-traded and OTC derivatives. OM is a publicly listed company, not a member-owned organisation. OTC-traded instruments cleared by OM fall into three categories:

(i) off-exchange transactions in standardised instruments that could be traded on OM Stockholm as an exchange but which are matched outside the exchange and later sent to OM Stockholm for clearing;

(ii) fixed income derivatives, including FRAs, Treasury bond and bill futures and interest rate swaps; and

(iii) tailor-made derivatives (the "Tailor-made Clearing" service - TMC): a wide range of OTC contracts for which stocks, currencies, bonds or commodities may be the underlying asset.

As with off-exchange trades, fixed income and tailor-made contracts are matched between counterparties and then sent to OM, electronically in the case of fixed income derivatives, for matching and registration. Off-exchange and fixed income trades eligible for clearing can be divided into cross-trades (internal trades among end-users, or internal trades between a clearing member and its client) and interbank trades (trades among clearing members). All participants including end-users have a direct legal relationship with OM. A clearing account is assigned to each participant and collateral margins are calculated per clearing account. Before OM accepts an off-exchange transaction for clearing, a check is carried out to establish that the price is sufficiently close to the market price.

OM's clearing of OTC derivative contracts is the same as its clearing of exchange-traded business. OM guarantees the performance of contracts by substituting itself as counterparty to both sides of the transaction - i.e. as a seller to the original buyer and a buyer to the original seller, on registration of the contract. Participants must provide initial margin and variation margin requirements are calculated and collected daily. Counterparty losses not covered by margin requirements are met from OM's own resources. Clearing members are subject to membership requirements, including adequate financial resources. Customers may open accounts directly with OM.

Under the TMC facility, OM accepts contracts for clearing only after the customised financial instrument has been subject to risk analysis. The majority of business consists of "plain vanilla" contracts and the service is not used for exotic derivatives. This is due to the significant margins required for these products.

6. The London Clearing House Ltd. (LCH): SwapClear

The London Clearing House (LCH) is planning to introduce clearing of certain widely traded OTC derivatives from August 1999. At present, LCH clears exclusively futures and options traded on three derivatives exchanges in the United Kingdom and equities for the electronic stock exchange Tradepoint. Under the planned facility for clearing OTC derivatives ("SwapClear"), LCH will initially add vanilla interest rate swaps and FRAs to the range of its cleared contracts. It will clear any contracts traded by members on the interbank market provided that they are denominated in one of the major currencies (US dollars, Japanese yen, sterling and euro - and, until 2002, the national legacy currencies), based on one of the main indices (e.g. LIBOR, EURIBOR) and are of a maturity of up to ten years.[13] Any reset and settlement dates may be chosen and forward starting contracts will be

[13] There are plans to add other types of contract - e.g. interest rate options (including caps, collars and floors), swaptions and cross-currency swaps - and other currencies, indices and maturities at a later date.

eligible. There will be two types of SwapClear user: SwapClear Dealers (SDs)[14] and SwapClear Clearing Members (SCMs).[15] For a trade to be cleared through SwapClear, both counterparties must be approved by LCH as SDs. An SD will have arrangements for clearing its business through an SCM (an SD could be its own SCM).

Contracts cleared by LCH under SwapClear will be traded as they are at present. But where both counterparties are SwapClear Dealers, they may choose, at the point of confirmation, to submit the contract for clearing rather than settling it bilaterally. Confirmations will be exchanged automatically via S.W.I.F.T. Accord or via another approved matching system and sent to the LCH, when matched, for clearing. Provided that the transaction falls within the parameters defined for SwapClear and would not result in LCH's unsecured exposure to an SCM increasing above a predefined credit limit, the transaction will be registered, i.e. the original contracts between the SDs will be replaced by two contracts between LCH and each SD's SCM and those between the SDs and the SCMs.

As with the futures and options which it clears at present, LCH will collect initial margin to protect itself against loss due to a default by a member. Initial margin requirements on SwapClear and LIFFE products will be offset where possible, consistent with LCH's overall risk management approach. LCH will also revalue all outstanding contracts every day, paying or collecting variation margin as cash collateral (initial margin requirements may be met by either cash or certain approved types of security such as government securities). Margin, reset amounts and coupon flows will be determined by the clearing house. All payments, including those arising on contracts that have been traded on the exchanges for which LCH clears, will be netted into a single payment flow per currency with each member each day. Exposures to members will also be monitored intraday and additional intraday margin may be collected.

In the event of a member default, LCH will be able, under its default rules, to terminate all outstanding transactions with that member and enter into replacement transactions or hedge its resulting exposure as necessary. Any losses will be offset against the defaulting member's margin and other LCH resources, including the member Default Fund, as necessary. LCH's default rules are expected to be covered by the same protection under English insolvency law as currently applies to the futures and options which it clears.

---

[14] SDs will have to be investment-grade rated and to be wholesale market participants (to be judged on criteria to be defined). They will also have to be able to send confirmation messages in S.W.I.F.T. format and to use an automated confirmation matching service, such as S.W.I.F.T. Accord.

[15] The criteria for an SCM include the requirement that it must either be an SD, or be guaranteed by a parent SD, or have financial resources of at least £250 million.

ANNEX 5

Bibliography

Bank for International Settlements (1996): *Central Bank Survey of Foreign Exchange and Derivatives Market Activity*. Basle: Bank for International Settlements, May.

Basle Committee on Banking Supervision (1994): *Risk Management Guidelines for Derivatives.* Basle: Bank for International Settlements, July.

Committee on Interbank Netting Schemes (1990): *Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries*. Basle: Bank for International Settlements, November.

Committee on Payment and Settlement Systems (1992): *Delivery Versus Payment in Securities Settlement Systems*. Basle: Bank for International Settlements, September.

Committee on Payment and Settlement Systems (1996): *Settlement Risk in Foreign Exchange Transactions*. Basle: Bank for International Settlements, March.

Committee on Payments and Settlements (1997): *Clearing Arrangements for Exchange-Traded Derivatives*. Basle: Bank for International Settlements, March.

Committee on Payment and Settlement Systems (1998): *Reducing Foreign Exchange Settlement Risk: A Progress Report.* Basle: Bank for International Settlements, July.

Euro-Currency Standing Committee (1986): *Recent Innovations in International Interbank Relations.* Basle: Bank for International Settlements, April.

Euro-Currency Standing Committee (1992): *Recent Developments in International Interbank Relations*. Basle: Bank for International Settlements, October.

Euro-Currency Standing Committee (1995): *Issues of Measurement Related to Market Size and Macroprudential Risks in Derivatives Markets*. Basle: Bank for International Settlements, February.

Group of Thirty (1993): *Derivatives: Practices and Principles*. Washington, D.C.: Group of Thirty, July.

Group of Thirty (1997): *Global Institutions, National Supervision and Systemic Risk*. Washington, D.C.: Group of Thirty.