

BANK FOR INTERNATIONAL SETTLEMENTS

**ISSUES OF MEASUREMENT
RELATED TO MARKET SIZE
AND MACROPRUDENTIAL RISKS
IN DERIVATIVES MARKETS**

Report prepared by a working group established by the
central banks of the Group of Ten countries

Basle
February 1995

© Bank for International Settlements 1995. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated. The reproduction or translation of longer excerpts requires prior approval by the BIS.

ISBN 92-9131-057-3.

ISSUES OF MEASUREMENT RELATED TO MARKET SIZE AND MACROPRUDENTIAL RISKS IN DERIVATIVES MARKETS

Table of contents

Preface

I. Introduction and summary	1
1. Information requirements.....	1
2. Recommendations.....	3
II. Information needs of central banks in relation to derivatives markets ...	6
1. Information needs relating to the economic effects of derivatives	6
(i) Characteristics of financial derivatives	6
(ii) Possible impact of derivatives on economic activity	7
2. Information needs relating to monetary policy issues.....	9
(i) Possible implications of derivatives for the transmission of monetary policy	9
(ii) Possible implications of derivatives for measures of money.....	11
3. Information needs relating to macroprudential issues.....	11
(i) Systemic risk and transparency	11
(ii) Uncertainty about credit risk	12
(iii) Concentration	13
(iv) Market liquidity	14
(v) Price dynamics in periods of stress	17
(vi) Market linkages	19
III. Data requirements and monitoring techniques.....	21
1. Introduction	21
2. Data requirements relating to the macroeconomic implications of derivatives markets.....	22
(i) Derivatives activity and the redistribution of price risk	22

3.	Data requirements from the macroprudential perspective.....	23
	(i) Data on the scale and distribution of credit exposures in derivatives markets.....	23
	(ii) Information required for assessing market liquidity.....	24
4.	Considerations bearing on the construction of market size statistics.....	25
	(i) Alternative approaches to market coverage.....	26
	(ii) Reporting burden and firms' internal data systems.....	27
5.	Other monitoring techniques.....	28
	(i) Direct market monitoring.....	28
	(ii) Simulations.....	29
IV.	Recommendations for data gathering.....	30
1.	Collection and dissemination of global market size data.....	30
	(i) Occasional surveys among a broad group of intermediaries.....	31
	(ii) Regular market reporting.....	34
2.	A forward-looking monitoring technique.....	36
	General overview table.....	37

Annexes

Annex I: Statistical Methodology

Annex II: Explanatory notes and survey forms for the April 1995
Central Bank Survey of Foreign Exchange and Derivatives
Market Activity

Annex III: Existing Data on Derivatives Market Activity

Preface

In 1993, the Euro-currency Standing Committee of the central banks of the Group of Ten (G-10) countries asked a Working Group to identify the principal macroeconomic and macroprudential information requirements of central banks in relation to global derivatives market activity. In the light of shortcomings in the existing data available to central banks, the Working Group was asked to develop measurement concepts and monitoring techniques that would address those needs and which would lend themselves to consistent international implementation. The Working Group, which was chaired by Jan Brockmeijer of the Netherlands Bank, delivered its report to G-10 Governors in September 1994.

The present report summarises the principal findings and recommendations of the Working Group. It is being released as a basis for discussion with market participants on the development of a framework for improved regular monitoring of the scale and structure of global derivatives markets activity. One of the Working Group's recommendations - to conduct a survey of derivatives markets activity in conjunction with the triennial Central Bank Survey of Foreign Exchange Market Activity - was endorsed by the G-10 Governors in May 1994 and is being implemented following consultations with market participants. The Survey, in which market participants in 26 countries will be participating, will be carried out in the month of April 1995. The questionnaire that was drawn up by the Working Group for the Survey is attached as Annex II to this report.

In addition to broad periodic surveys of global market activity, the Working Group recommended that central banks, in consultation with market participants and supervisory authorities, should initiate the regular compilation of market activity statistics based on data from the principal participants in derivatives markets. These statistics should, through their regular dissemination, make an important contribution to improving transparency in derivatives markets, and should provide a basis for ongoing monitoring of the implications of derivatives market activity for areas of central bank policy responsibility. The present report invites the reaction of market participants to the Working Group's recommendations regarding regular market reporting. It is envisaged that a framework for the regular compilation of market activity statistics will be drawn up in the light of the results of the Spring 1995 Survey.

This report has benefited from an earlier study, "Recent Developments in Interbank Relations" (the "Promisel" report), published by the BIS in 1992. It is part of a broader undertaking by G-10 central banks to assess the implications of derivatives markets for central banks' policy responsibilities and for financial market functioning

more generally. Two related reports have recently been published by the BIS: "A Discussion Paper on Public Disclosure of Market and Credit Risks by Financial Intermediaries" (the "Fisher" Report), September 1994, and "Macroeconomic and Monetary Policy Issues Raised by the Growth of Derivatives Markets" (the "Hannoun" report), November 1994.

Members of the Working Group

Chairman	Jan W. Brockmeijer Netherlands Bank
National Bank of Belgium	Johan Pissens
Bank of Canada	Nick Close
Bank of England	Norman Williams
Bank of France	Gérard Beduneau Patrick Haas
Deutsche Bundesbank	Dietmar K.R. Klein
Bank of Italy	Ezio Dosa
Bank of Japan	Satoshi Kawazoe Tadashi Uhira
Monetary Institute of Luxembourg	Norbert Goffinet
Netherlands Bank	Eloy Lindeijer
Bank of Sweden	Anne Westman
Swiss National Bank	Werner Hermann Dewet Moser
Board of Governors, Federal Reserve	Allen Frankel Paul Kupiec
Federal Reserve Bank of New York	John Kambhu
Bank for International Settlements	Svein Andresen Serge Jeanneau

Adam Gilbert of the Federal Reserve Bank of New York, Jos Heuvelman of the Netherlands Bank and Rainer Widera of the Bank for International Settlements also contributed to the work of the Working Party.

I. Introduction and Summary

The rapid growth of derivatives markets in recent years has revealed a need for better statistical data to assess the implications of these markets for the policy responsibilities of various public authorities. This report discusses the statistical information requirements of central banks in relation to global derivatives market activity and sets out a basis for coordinated data collection aimed at increasing market transparency and facilitating monitoring by central banks of the macroeconomic and macroprudential implications of derivatives markets. In view of the reporting burdens faced by institutions in many countries, the report's recommendations centre on a core set of data to be aggregated at the international level.

1. Information requirements

The principal economic function of derivative instruments is to facilitate risk transformation by individual agents. Derivatives markets cannot transform elemental risks in the aggregate but they do facilitate a redistribution of such risks between agents and economic sectors. While the gains and losses of counterparties to derivative contracts constitute zero-sum redistributions, the heterogeneity of end-users implies that aggregate economic effects may follow from the use of these instruments. That is, derivatives may release users from pre-existing constraints without imposing countervailing constraints elsewhere, and may alter users' sensitivities to changes in their risk environments. Consequently, in the aggregate, redistributions of interest rate and exchange rate risks may affect the impact of policy measures on final demand and output.

The assessment of the possible macroeconomic implications of this risk transfer function would be facilitated by market size data which distinguish, for example, underlying market risk categories (exchange rates, interest rates, equity prices and commodity prices), the maturity of contracts and the types of counterparties to transactions. Greater detail on the risks transformed in foreign exchange and interest rate markets should be contemplated since these markets are particularly important for central banks. Given the role of the financial system in transmitting monetary policy changes, the data should distinguish between financial and non-financial counterparties to derivatives contracts. A further breakdown by type or sector of end-user counterparties would offer further insights into the scale and direction of risk transfers in the economy. However, in the absence of detailed aggregate information on the underlying risk exposures of various end-user groups, it is unlikely that such data would

lend themselves to ready interpretation - this points to caution regarding the detail of the data which central banks should request.

The principal concern of central banks from the macroprudential perspective centres on the general lack of transparency in derivatives markets. This lack of transparency applies to the activities undertaken by individual institutions as well as to the scale and distribution of aggregate risk exposures in derivatives markets. Inadequate information regarding the size of firms' risk exposures can suddenly and severely affect participants' standing in markets and result in a denial of funding and trading access. Likewise, inadequate information about aggregate positions and hedging demands can lead market participants to base risk management strategies on incompatible assumptions about the robustness of market liquidity.

Other macroprudential concerns that central banks wish to be able to monitor relate mainly to aspects of market structure. For example, the market-making function supporting liquidity in many segments of the derivatives markets is reportedly performed by a relatively small number of institutions. Market liquidity is likely to be less resilient to shocks in markets where the market-making function is highly concentrated rather than widely dispersed. Should an erosion of liquidity occur, price volatility could increase and market participants' ability to manage their exposures could be impaired, thus increasing their vulnerability to price shocks. Owing in part to concentration in the market-making function, credit exposures among derivatives dealers are also reported to be high, netting arrangements notwithstanding. Inter-dealer exposures which are large in relation to firm capital could exacerbate contagion risk and could inhibit the market's ability to absorb large price changes. The growth of options markets and the spread of associated dynamic hedging strategies may increase the risk that an initial price change in underlying markets could be amplified by positive feedback effects. Likewise, the market linkages engendered by derivatives transactions that straddle various market segments could cause an initial price shock to travel farther and faster than in the past.

Properly constructed market size data would enable central banks and other authorities to monitor most of these concerns. When combined with improvements in public disclosure by individual firms, the dissemination of such data would also help alleviate transparency problems among market participants and strengthen risk management practices. A breakdown by the main product categories (e.g. forwards, swaps and options) under each market risk segment would enhance the value of the data for central banks and market participants. For example, data on more narrowly defined market segments would allow central banks to monitor market specific concerns and enable market participants to assess the scale of their own activity in relation to the

markets as a whole. However, these benefits must be balanced against the reporting burdens that would be placed on reporting firms.

2. Recommendations

The current lack of transparency, the information requirements summarised above and deficiencies in currently available data led the Working Group to recommend that central banks expand their collection of data on derivatives markets. An internationally coordinated approach to collecting these data would aim to shed light primarily on the size and structure of the global over-the-counter (OTC) derivatives markets. Direct central bank involvement in the collection and compilation of the data would enhance the meaningfulness, reliability and international consistency of the statistics and would ensure that central banks have access to the underlying data for further analysis.

The existing data on derivatives markets, whether gathered by central banks or by market associations, have a number of important shortcomings. First, differences among various reporting systems in terms of the range of instruments and institutions covered have precluded consistent aggregation of reported data. As a result, it has not been possible to compile comprehensive data on the scale of global derivatives market activity - covering both banks and securities firms - from existing data. Second, existing data focus primarily on the notional amounts of contracts outstanding and are, as a result, relatively un-informative as to the size and distribution of risks incurred in derivatives markets. Third, existing data provide only limited information on the structure of participation in derivatives markets. Finally, the data do not lend themselves to assessing issues such as liquidity in derivatives markets or the nature of the market dynamics engendered by derivatives trading.

The Working Group recommended two complementary approaches for the collection of data needed for compilation of global market size statistics: (i) occasional surveys of a large number of participants to obtain broad scans of derivatives market activity, to be held in conjunction with the existing triennial Survey of Foreign Exchange Market Activity, and (ii) a system of regular market reporting confined to the main intermediaries in the derivatives markets.

The Working Group considered that both regular market reporting and occasional surveys would have their advantages. Regular market reporting would provide relatively timely data on developments in derivatives markets and, by concentrating on the largest firms in the markets, would achieve significant coverage with the reporting burden being confined to a smaller number of institutions. The survey will provide a broad scan of the scale and structure of participation in global

derivatives markets; it will yield data on turnover in OTC and exchange-traded derivatives markets, as well as contemporaneous data on cash foreign exchange market transactions; and it will bring forward the time at which comprehensive information on global derivatives market activity will become available.

Both the survey and regular market reporting would collect data on the notional and market values of outstanding contracts, disaggregated by broad underlying market risk classes (i.e. exchange rates, interest rates, equity and commodity prices). There would also be a disaggregation by instrument type, counterparty type, maturity and currency. To shed light on linkages between OTC and exchange-traded markets, it is also envisaged that information would be collected on the exchange-traded activities of reporting institutions.

In view of the desire to contain reporting burdens, there are limits to the detail that can be generated by the above approaches to the compilation of global market statistics. To the extent that greater detail is required for domestic policy purposes, such detail could be requested by individual central banks. Supervisors of financial institutions and compilers of national account and balance of payments statistics are also examining data requirements in relation to derivatives market activities. While these requirements are likely to differ in some respect from those considered above, coordination among the relevant bodies will seek to ensure that unnecessary overlaps in data collection are avoided so as to minimise the reporting burden on market participants.

In addition to approaches based on historical data, the Working Group considered that insight into market linkages and possible price dynamics engendered by derivatives trading may be increased through simulation based approaches applied to dealers' risk management systems. Such approaches may provide a less burdensome way of yielding meaningful information for assessing the possible implications of derivatives trading for market functioning. The Working Group recommended that central banks support further research in this field through collaborative efforts.

The remainder of this report is organised as follows: Chapter II discusses information requirements from the macroeconomic and macroprudential perspectives. Different approaches as to how the resulting data needs can be met, which depend in part on central bank priorities and the likely cost of alleviating information gaps, are discussed in Chapter III. The Group's recommendations for the gathering of data are set out in Chapter IV. The report also contains a discussion of statistical methodology appropriate for the international aggregation of nationally reported data (Annex I), the survey forms on which the April 1995 Survey of Foreign Exchange and Derivatives

Market Activity will be based (Annex II), and an overview of existing statistical data on derivatives market activities (Annex III).

II. Information needs of central banks in relation to derivatives markets

This chapter surveys the information requirements of central banks in relation to derivatives markets. Reflecting central banks' principal areas of policy responsibility, these information requirements relate to the implications of derivatives market activity for economic and monetary conditions and for financial market stability. The discussion also seeks to identify, in very broad terms, the types of data that would shed light on these implications, with a view to identifying a core data set that would satisfy central banks' main information needs. The discussion draws on analyses undertaken by the Working Group and on previous studies prepared by central banks and other bodies.¹

Given the recent growth in size of derivatives markets, firm conclusions about their implications for the above areas of central bank policy responsibility cannot be drawn at this stage. In this light, the information requirements noted below may seem large, in particular when compared to those which central banks have in relation to established markets. Better statistical data would advance relevant research on these implications. However, both market participants and central banks incur costs in data gathering efforts. As in any statistical endeavour, therefore, it is important that both the underlying rationale for gathering the data discussed in this and the next chapter, and the usefulness of the statistics subsequently compiled, should be subject to regular review.

1. Information needs relating to the economic effects of derivatives

(i) Characteristics of financial derivatives

A financial derivative is a contract whose value depends on the prices of underlying assets, but which does not require any investment of principal in those assets.² As a contract between two counterparties to exchange payments based on

¹ These include *Recent Innovations in International Banking*, ECSC/BIS, April 1986; *Recent Developments in International Interbank Relations*, ECSC/BIS, October 1992; *Macroeconomic and Monetary Policy Issues raised by the Growth of Derivatives Markets*, ECSC/BIS, November 1994; and *Derivatives: Practices and Principles*, Group of Thirty, Washington, D.C., July 1993.

² There are two broad classes of financial derivatives: contracts with forward characteristics and contracts with option characteristics. Forward contracts have two-way transfers of risk and, by market convention, their initial market value is zero - this enables counterparties to assume

underlying prices or yields, any transfer of ownership of the underlying assets and cash flows becomes unnecessary.

The returns from a derivative transaction can be tied to any observable price or performance feature of financial assets. Derivatives can therefore be used to unbundle and trade separately the components of risk embodied in those financial assets. This allows economic agents to tailor their exposures more closely to their investment or funding preferences. For example, an investor in a foreign equity market who has no appetite for currency risk can use derivatives transactions to structure an investment position with exposure to the foreign equity market but without exposure to the foreign currency. Due to these characteristics, derivatives are a highly efficient means of hedging and trading risk exposures. For instance, a bank with a mismatch in the maturity of its assets and liabilities can use derivatives efficiently to hedge the interest rate risk of its structural position. An equivalent interest rate risk management strategy that did not make use of derivatives would require either the restructuring of the bank's assets and liabilities at potentially disadvantageous terms or, alternatively, adding assets and liabilities with offsetting maturities to the original balance sheet structure with potentially negative consequences on the bank's capital requirements or exposure to credit risk.

While a risk transfer equivalent to that of a derivative contract can often be accomplished by cash market transactions, the associated transactions costs are likely to exceed the costs of entering into a derivative contract. Thus the lower transactions costs and limited initial cash demands of derivatives allow a trading of risks that might not have been contemplated in their absence.

(ii) Possible impact of derivatives on economic activity³

By facilitating the trading of price risk exposures between agents with offsetting hedging needs, or between those who wish to hedge risk and those willing to acquire it, the emergence of derivatives markets has led to a greatly increased level of trade in underlying or elemental financial risks in the economy. Such trading might be expected

potential risk exposures with no up-front cash payment. Options have one-way transfer of risk for which the option writer receives an up-front cash payment (the option premium) equal to the expected value of the option payoff at contract initiation. This premium can be a small fraction of the potential payoff from the option, providing the option buyer with significant leverage.

³ For a further analysis of the issues discussed in this and the next section, see *Macroeconomic and Monetary Policy Issues Raised by the Growth of Derivatives Markets*, op. cit.

to provide tangible benefits, and the extraordinary growth of the derivatives markets suggests that this is the case.

Even though the gains and losses of the counterparties in a financial derivative transaction constitute a zero sum pecuniary redistribution, the unbundling and trading of elemental risk components and the heterogeneity of derivatives' users imply that real aggregate effects may follow from their introduction. For instance, an economic agent's ability to hedge unwanted risks while retaining others through the use of derivatives transactions may, at least at the margin, promote investment that would not otherwise occur, even though the pecuniary gains and losses of the hedge transaction are zero sum in the aggregate. As an example, consider an oil producer with expertise in exploration and extraction of oil whose prospective investment is exposed to exploration risk and production risk, as well as to oil price, currency and interest rate risks. This firm's ability to hedge its exposure to oil price, currency and interest rate risks, while retaining exposure to those risks in which it has expertise (exploration and production), could lead to an investment that otherwise would not be undertaken. On the other side of the hedge transactions, those economic agents acquiring the exposures may either be hedgers of offsetting exposures or speculators. In either event, these counterparties are willing to acquire the price risks but not the exposures to exploration and production risk. Hence, the use of derivatives to unbundle these elemental risks and redistribute them to those most willing or able to bear them can affect real economic activity.

The use of derivatives to match more closely the desired exposures of lenders and borrowers should enlarge the scope for mutually agreeable funding arrangements. For example, a borrower may issue a debt instrument with the type of interest payments desired by the lender willing to lend at the lowest credit risk premium and then, with a swap, transform its own ultimate interest payment obligations into those that better match its cash flows. This unbundling of credit risk from interest rate risk provides benefits to both borrowers and lenders, and should lead to lower risk premia in financing decisions.

In normal circumstances, derivatives generally contribute to greater liquidity in the markets for underlying price risks. This has been observed in a number of government debt markets following the introduction of futures contracts. The ability to trade in derivative contracts facilitates arbitrage trades that exploit anomalies in securities prices. By creating demand for underlying securities that would otherwise be thinly traded, such arbitrage trades help reduce liquidity premia in yields on underlying securities. Likewise, dealers' ability to use derivatives to better manage the market risk exposures of their inventory should enable dealers to provide finer spreads to customers.

Information needs:

Most of the effects considered above are indirect and may be of a one-off character. They do not entail detailed data requirements. However, data on aggregate derivatives market activity (stocks and turnover) would assist in the development of a better understanding of the role of derivatives in the overall economic and financial market environment. To provide insight into the risk transfer role of derivatives markets, such data should be gathered according to types of underlying risks traded, distinguishing between futures and option-like instruments, and containing some distinctions between types of counterparties.

2. Information needs relating to monetary policy issues

The introduction of financial derivatives is only one of many changes in financial markets that have occurred in recent decades, such as financial deregulation, the evolving role of securitized debt markets, stronger integration of the international economy and greater cross-border links between domestic markets. Many of these changes have enlarged the range of choices available to economic agents and may have altered behaviour in ways not unlike those arising from derivatives.

Financial derivatives are not likely to change the basic ways in which monetary policy influences economic activity. Instead, they might modify the sensitivity of some economic variables to monetary policy changes, as well as possibly affecting the timing of their effects. They might also affect the interpretation of various policy indicators. To highlight possible information requirements that arise in these respects, the following discussion explores briefly some examples of how derivatives markets might affect the transmission channels of monetary policy and how they might impact policy indicators, such as monetary aggregates.

(i) Possible implications of derivatives for the transmission of monetary policy

The channels of transmission of monetary policy

The transmission of monetary policy is usually considered to operate through three channels: the interest rate channel, the exchange rate channel and the credit channel.

The interest rate channel refers to the mechanism whereby changes in short-term interest rates, once transmitted to other interest rates and asset prices, have a direct effect on marginal consumption and investment decisions. The immediate financial market impact of policy-induced interest rate changes is likely to be conditioned by the range of trading opportunities available to investors. By increasing asset substitutability

and enabling investors to express their market views more vigorously through leverage, derivatives may increase the already rapid transmission of short-term interest rate changes to bond markets and other financial asset prices. The greater number of instruments with option-like exposures and the accompanying dynamic hedging of these positions could also amplify and propagate an initial monetary shock.

Although the economy as a whole clearly cannot be shielded from the effects of changes in interest rates, individual economic agents can use derivatives to transform their interest rate exposures by shifting the risks to those most willing to bear them. To the extent that derivative contracts lift constraints for some agents without imposing countervailing constraints elsewhere, the income and wealth effects associated with such risk transfers could affect the way in which monetary policy actions are transmitted to the economy in general. However, because risk transfer contracts have a finite life and must be replaced at market rates at maturity, their effect on the transmission of an interest rate change can only be temporary.

Derivatives may strengthen the exchange rate channel to the extent that they facilitate portfolio reallocations across national financial markets and thus speed up exchange rate adjustments. For example, changes in the differential between domestic and foreign interest rates may now produce proportionately larger changes in the exchange rates, due to the higher substitutability of domestic and foreign assets. However, widespread hedging of foreign exchange exposures could also delay the impact of changes in exchange rates on the tradable goods sector of the economy. For example, if importers were to hedge a significant proportion of their foreign exchange requirements, the inflationary effects of a depreciating national currency could be reduced. Similarly, widespread hedging by exporters could slow the erosion of export competitiveness from an appreciating currency. As is the case for the interest rate channel, the effect of exchange rate changes cannot be avoided in the long run as hedging transactions mature and must be replaced at market rates.

The credit channel transmits monetary policy to aggregate demand by affecting the volume and composition of credit extended by the banking sector. To the extent that firms are subject to credit rationing by banks and are unable to substitute alternative sources of funding for bank loans, changes in the supply of bank credit will affect their investment decisions. By increasing the efficiency of financial markets and helping borrowers and lenders overcome some of the risks arising from financial transactions, derivatives may widen firms' access to alternative funding sources and thus weaken the impact of this channel.

(ii) Possible implications of derivatives for measures of money

The use of derivatives in the trading of exposures embedded in traditional financial assets and liabilities may influence the information content of monetary aggregates. For instance, the use of derivatives to hedge the price risk of traded assets that are not included in measures of the money stock can expand the stock of assets serving transactions purposes. In the event, monetary aggregates may understate the stock of assets providing money services. The demand for money balances may also be influenced by derivatives if derivative operations are used as a substitute for outright transactions in underlying cash markets. To the extent that derivatives transactions do not require the exchange of principal, they reduce the demand for short-term transactions balances. However, the scale of trading of exposures has also increased in recent years, making the net effect on trading related demands for transactions balances ambiguous.

Information needs:

To assess the effect of derivatives on the economic and financial environment in which monetary policy operates, data on the size of derivatives markets and economic agents' use of them are required. The data should, at a minimum, contain information about the use of derivatives at the level of economic sectors or classes of users.⁴ As in the case of the more general economic implications of derivatives, the data should be categorised by type of underlying interest rate and other price risk exposure. For example, data about the role of derivatives in the maturity transformation of exposures would be useful.

3. Information needs relating to macroprudential issues

(i) Systemic risk and transparency

A systemic crisis is a financial disturbance that causes widespread disruptions elsewhere in the financial system.⁵ Disruptions with systemic ramifications could

⁴ Derivatives transactions are generally undertaken to change underlying exposures. To the extent that data on agents' underlying exposures are available, data on derivatives transactions will provide a more complete picture of the economic and financial environment. When data on underlying exposures are unavailable, however, the interpretation of derivatives data may be difficult.

⁵ For a definition of systemic risk, see *Recent Developments in International Interbank Relations*, op. cit., page 25.

include one or more of the following: liquidity or solvency problems at key financial intermediaries, a payments system disruption, a disruption in credit allocation, and illiquidity of important markets or other disruptions to the pricing of financial assets. Such disruptions can lead to untimely liquidations of positions or firms which fail to realise economic values that could be obtained in the absence of distress. In extreme cases, liquidations of firms can lead to losses of wealth.

Some of the concerns about the implications of derivatives markets for systemic risk arise from the limited transparency of activities undertaken in these markets, both by individual institutions and in the aggregate. This lack of transparency can heighten the risk of misjudgements. For example, lack of information about counterparty risk profiles could cause "runs" and liquidity problems during periods of stress. Additionally, inadequate information about the potential aggregate impact of market participants' positions and hedging demands can lead risk management strategies of individual participants to be based on incompatible assumptions about the robustness of market liquidity.

Better data on the scale and distribution of risk exposures in derivatives markets would therefore be useful to central banks and market participants alike. Such information would enable central banks to make more informed judgements about derivatives markets and their effects on other financial markets, including their potential role in the propagation of shocks. For market participants, enhanced market transparency would facilitate risk management by enabling them to avoid concentrations of exposures and positions that expose them to unforeseen risks in times of rapid asset price changes.

(ii) Uncertainty about credit risk

An important potential source of systemic risk in OTC markets is associated with the lack of transparency of counterparties' exposures to market and credit risks arising from derivatives and trading related activities. Under current disclosure standards, the effect of a price shock on the financial condition of a counterparty with a large trading position (including derivatives) cannot be assessed by outsiders with any degree of confidence. Uncertainty about firms' creditworthiness increases the risk that creditors will back away from a solvent institution experiencing liquidity problems and that troubles at one firm are erroneously assumed to be present at other firms with similar activities. The opacity of exposures could also lead to the build-up of concentrations of exposures with a firm whose true creditworthiness is below the market's perceptions. Revelation of the firm's true creditstanding could cause a rapid retrenchment by counterparties in ways that could introduce systemic stress.

In the face of a large price shock, uncertainty about a firm's exposures can also impair its capacity to enter into financial transactions. Risk management strategies that require dynamic hedging or rolling of positions can be seriously disrupted by the reluctance of counterparties to transact with the firm, as well as by the cash demands of collateral and margin requirements. This could leave the firm exposed simultaneously to price, cash liquidity and funding risks. A lack of transparency can also compromise a market's ability to adjust to large price shocks. When asset prices change sharply, maintenance of market liquidity may require that market participants in the aggregate absorb increased levels of counterparty credit exposures. However, they may be reluctant to do so if they are unable to assess the creditworthiness of counterparties.

Information needs:

To improve counterparty creditworthiness assessment, market participants and accounting bodies should seek improvements in accounting and public disclosure practices that would reveal the sensitivity of a firm's exposures to important categories of risk.⁶ As for aggregate statistical needs, data on interdealer credit linkages, including credit extended and received in outstanding derivatives positions, would shed light on the manner in which shocks could propagate through wholesale markets and payments systems. Data on credit exposures in derivatives positions between dealers, other financial institutions and non-financial end-users would also be useful. The dissemination of aggregated statistics generated from such data could enhance risk management in derivatives markets.

(iii) Concentration

Data provided by market associations suggest that market making in certain segments of derivatives markets is highly concentrated. This concentration, largely confined to highly rated firms, is due to the high costs of setting up derivatives operations and to the hedging advantages of large portfolios. A large dealer's derivatives portfolio benefits from naturally offsetting positions that reduce the residual exposure which must be hedged. A smaller residual exposure relative to the size of the portfolio reduces hedging costs and confers pricing advantages.

⁶ See *A Discussion Paper on Public Disclosure of Market and Credit Risks by Financial Intermediaries*, ECSC/BIS, September 1994 for proposals aimed at improving public disclosure of market and credit risks.

Although a certain degree of concentration of derivatives markets may have some benefits, it can adversely affect the resilience of market liquidity and can increase the potential for contagion problems. The maintenance of market liquidity after the retrenchment or bankruptcy of a major market maker in a highly concentrated market will require the remaining dealers to take on a proportionately larger amount of additional credit and market risks than would be the case if market making was less concentrated. Hence, the withdrawal of a dealer from market making may impair market liquidity if remaining dealers cannot absorb significant increases in their exposures.

Available data suggest that inter-dealer transactions account for a large share of credit exposures. If the credit exposures that arise in these transactions are large in relation to capital, the failure of a large dealer could heighten the risk of default contagion. The growing use of enforceable netting arrangements may significantly reduce such inter-dealer credit exposures. It should also be kept in mind that credit exposures resulting from derivatives activities may be relatively small compared to total interdealer credit exposures. Measures of concentration of credit risk in derivative markets may therefore give only a partial picture of contagion risks.

Information needs:

Concentration in the market-making function in derivatives markets could be monitored with data on the size of markets and individual dealers' turnover and outstanding positions. Concentration of credit risk exposures among participants in derivatives markets could be monitored by the use of counterparty breakdowns. Dissemination of aggregate data on the distribution (concentration) of credit exposures could facilitate risk management on the part of individual market participants.

(iv) Market liquidity

Episodes of illiquidity in financial markets can occur for a variety of reasons, some of which are normal and unavoidable features of market dynamics.⁷ Whatever its cause, however, market illiquidity could precipitate other problems. Derivatives have

⁷ For example, market making becomes riskier when uncertainty about future prices is greater. Market makers typically respond to this risk by widening bid-ask spreads, or even withdrawing from market making. Another potential cause of liquidity disruptions in derivatives markets is uncertainty about credit exposures in OTC derivatives transactions. As noted above, uncertainty about counterparties' creditworthiness can make market participants reluctant to enter into new transactions and thus impair market liquidity.

become a principal means by which price risks are traded. In times of stress, illiquidity in derivatives markets will disrupt the intermediation of risk between those who want to shed exposures and those willing to acquire risks. Such erosions of the risk transferring capacity of derivatives markets can disrupt risk management and hedging strategies and, for those affected, result in involuntary exposures to price risk. A liquidity erosion which disrupts risk management strategies may cause investors to liquidate positions in underlying assets and cause shocks to be amplified or transmitted across markets. For example, difficulty in hedging exchange rate exposures may induce foreign investors to liquidate their underlying positions in a country's equity and bond markets.

An impaired ability to manage exposures during episodes of market illiquidity can make market participants more vulnerable to a variety of shocks. Periods of market illiquidity can be associated with broader episodes of financial stress. In such cases, a firm experiencing a funding liquidity crisis will have greater difficulty meeting its financing needs if illiquidity or price volatility in markets in which it holds "in-the-money" positions prevents or delays the closing out of those positions.

The degree of market liquidity may not be amenable to precise measurement. Generally, a market is said to be more liquid when a large trade (in terms of notional amount or risk profile) can be done quickly without moving the price at which trades are executed, or when a position can be reversed quickly without significant cost from the payment of a bid-ask spread. Illiquidity can be manifested in wider bid-ask spreads, a smaller transaction size for which a quoted price is good, and in less quantifiable ways such as market makers withdrawing from the market. Illiquidity of the latter two forms would not appear in historical time series of bid-ask spreads.

Liquidity and substitute products

An evaluation of the liquidity in a particular derivatives market must take account of the existence of substitute products. For example, an exposure to US dollar interest rates can be acquired or hedged in a variety of products and markets, such as interest rate swaps, forward rate agreements, Eurodollar futures or US Treasury bill futures. In addition, an exposure similar to that produced by any of these derivatives transactions can be created by positions in US dollar denominated debt securities, bank deposits and borrowed funds. The existence of such substitute hedging opportunities for a particular type of elemental risk means that, for many purposes, questions about the illiquidity of a particular derivative instrument should be considered in the context of the liquidity of its substitutes.

In spite of the availability of substitute products, however, an individual market participant might have only a limited ability to substitute quickly between products. In OTC markets, the existence of counterparty credit limits may limit a market participant's ability to make use of alternatives, for example, if the substitute product is traded by a dealer with whom the customer does not already have a trading relationship. In exchange-traded markets, or whenever collateral is required, the need for credit lines or liquid assets to support margin and collateral requirements may also hinder the ability to substitute quickly between products. Additionally, for market participants with small trading operations, using substitute products is not a trivial exercise because doing so requires expertise as well as adequate back office systems.

Other institutional or technical characteristics of products containing similar risk exposures can also make them less than perfect substitutes for some users. For example, the margin requirements of exchanges imply that the cash demands of exchange-traded contracts will differ from otherwise similar OTC products. For a customer hedging a long term position, the margin requirements of exchange-traded contracts that are marked-to-market daily can create cash flow asymmetries between the long term position and the hedging contract. Even though the two positions offset each other in terms of present values, the asymmetries in the cash flows can create cash liquidity problems when prices change sharply.

When option market liquidity is inadequate, market-makers must rely on the synthetic replication of their option positions through dynamic hedging. Aside from involving transactions costs, dynamic hedging requires the continuous availability of liquidity in underlying markets. However, in the wake of a sizeable price shock, liquidity in underlying markets is likely to be tested as well.

The simultaneous existence of substitute products and frictions in substituting among them imply that the evaluation of market liquidity is an analytical problem as well as a complicated measurement exercise.

Information needs:

In considering information needs about market liquidity, a useful distinction can be made between liquidity in normal market conditions and the resilience of liquidity during financial disturbances. Measures of normal market liquidity are useful when market participants are attempting to gauge the average liquidity of a market in which they participate or are considering participation.

Central banks also need information on normal liquidity as a baseline for gauging the evolution of liquidity in stressful situations. Knowledge about which products and markets are most reliable providers of liquidity for trading a particular

type of exposure could help central banks to focus their attention on those markets that are expected to function as "shock absorbers". This information could also be useful to central banks for evaluating possible disruptions to the financial system's ability to transfer risks and exposures. Such disruptions to the intermediation of risks could delay the return of the financial system to normality after a shock.

Information which sheds light on the potential resilience or fragility of liquidity could also benefit market participants. For example, some major participants in derivatives markets do not assume a role as market makers. Their activities may improve liquidity in normal times, but heighten the vulnerability of the markets to a sharp loss of liquidity in times of stress. Information about the participation of different types of firms could thus enhance central banks' and market participants' abilities to understand the dynamics of market liquidity under stress.

(v) Price dynamics in periods of stress

The influence of derivatives on asset prices may be different in times of stress and normal market conditions. Under normal conditions they may enhance trading and the efficient pricing of risks. In addition, if the redistribution of risks made possible by derivatives causes shocks to be dispersed, derivatives may also make financial markets more resilient. However, during periods of large changes in asset prices, derivatives might play a disruptive role in the dynamics of asset prices.

Derivatives enable financial market participants to respond faster to shocks. While advances in communications technology have been central in promoting faster responses in financial markets as a whole, the low transactions costs of derivatives contracts may also have lowered the threshold at which economic agents will react to new information about financial asset values. While this development has the potential to enhance market efficiency, it may also have the potential to increase volatility. Normally, trading by fundamentals-based traders would tend to counter destabilising price dynamics. However, if derivatives amplify shocks or cause them to spread faster, then prices may move a great deal before a market's overreaction is countered by traders acting on the basis of underlying economic considerations. In an extreme case, a sharp price change could precipitate further shocks such as liquidity problems among financial firms or a payments system disturbance. Credit intermediation that normally solves such liquidity problems can fail during periods of rapid price changes because the information required for credit decisions cannot be updated sufficiently rapidly during such episodes.

Positive feedback

Positive feedback refers to the processes that amplify price changes in a market, causing an initial price change to be followed by further changes in the same direction. The role of derivatives in positive feedback can arise from a variety of sources. For example, one by-product of the growth of trading of options and option-like instruments (i.e. products containing implicit or embedded options) has been increased use of dynamic hedging techniques. Dynamic hedging of written options exposures can contribute to positive feedback because it entails increased purchases of the underlying asset as prices rise and selling when prices fall.⁸

Margin and collateral provisions can also contribute to positive feedback effects. Such effects may arise if the underlying securities must be sold to meet collateral or margin calls when prices fall sharply. While these arrangements are most common on exchange-traded markets, they are also increasingly present in OTC markets.

Hedging overhang

Another potential source of price volatility arises from hedging overhangs. Reliance on particular products or markets for hedging in risk management strategies may be rational in normal two-way markets but impossible in the aggregate when undertaken by many market participants simultaneously during a market break. Large price moves may trigger hedging actions which appear reasonable to each individual firm but which, in the aggregate, can introduce one-way market dynamics in the markets for the principal hedging instruments.

This concern applies, inter alia, to derivatives exchanges, which often serve as the hedging venue of last resort due to their relatively high degree of liquidity and credit controls. Two related issues are whether extreme one-way market conditions can emerge that lead to large price moves in the hedging market; and whether surges in demand for a key hedging instruments, such as futures traded on exchanges, can be accommodated. One-way market conditions are unlikely to be initiated by the technicalities of derivatives markets (e.g. positive feedback from dynamic hedging), but

⁸ The dynamic hedging of options positions is most likely to be done by dealers hedging their net written options. Investors (such as pension funds that hold the underlying asset) who write options for yield enhancement normally do not dynamically hedge their written options. End-users who purchase an option as an investment or speculative transaction will not routinely hedge the option because doing so will negate their desired speculative or investment exposure. Instead, these buyers might close out the option only after it is significantly "in-the-money" to lock in their profits. Any related dynamic hedging by the option writer (dealer) will cease at that point in time.

will instead emerge from changes in investors' sentiments or underlying economic conditions. Hence, total hedging demands during a market break cannot be forecast from data on derivatives markets alone. However, such data could shed light on the additional hedging pressures which can arise from derivatives markets and which could serve to amplify shocks.

Information needs:

Information about the concentration of options strike prices could reveal the potential scale of dynamic hedging pressures and resulting positive feedback that could arise in response to an initial price move. Such information could provide forewarning of hedging and risk management strategies that may not be feasible in the aggregate. Data on strike price distributions are readily available from exchanges, but are unlikely to be easily collectable from OTC markets. However, the potential market-wide effects of dealers' dynamic hedging needs might be assessed on the basis of the aggregation of outputs from firms' risk management models.

(vi) Market linkages

Derivatives facilitate hedging, arbitrage, funding and investment strategies that straddle various market segments, both domestically and internationally. This, along with deregulation and technological advances in the financial arena, has strengthened linkages between markets, particularly across national borders.

Cross-border funding strategies that exploit differences in the cost of capital have been common in recent decades. In these transactions, a borrower may raise funds in a currency in which it can obtain the most advantageous credit terms and then use a currency swap to convert the interest rate and currency exposures of the loan into ones that match the cash flows of the project for which the funding was obtained. Such transactions create linkages between capital markets across countries as well as linkages between capital and currency markets.

Some arbitrage transactions span multiple markets, particularly in their funding and hedging components. Executing these arbitrages often requires the dynamic rolling of positions which in turn depends critically on market liquidity and market access. An inability to roll these positions could force the unwinding of the arbitrage position and transmit shocks across the markets involved in the arbitrage transactions. Closer linkages, as in these examples, would make markets more efficient by offering alternative sources of supply and demand, enlarging trading opportunities and ultimately improving the allocation of capital. However, in times of stress, closer linkages can also increase the scope for disturbances to be quickly transmitted between

markets. Such wider and faster transmission of shocks may dilute and disperse their impact, or may amplify their disruptiveness.

Another linkage works through margin or collateral requirements. Price changes in instruments that require margin payments have a direct impact on the cash liquidity of a firm that holds a position in them. Hence, to meet margin calls, firms may be forced to liquidate profitable positions in other markets, thus propagating price effects more widely.

Finally, linkages can arise from the same dealers performing the role of principal market maker in various markets. If one firm ceases to perform this role, the functioning of these market segments could be affected.

Information needs:

To the extent that stock and flow data are available on major cross-market products, they may, together with some detail about the types and location of counterparties to these transactions, shed some light on the nature of cross-market linkages formed by derivatives. Furthermore, stock and turnover data can help identify linkages resulting from the same dealers performing the role of principal market maker in various markets. However, since cross-market derivatives transactions are often undertaken in conjunction with cash market transactions, data on derivatives markets alone would shed only partial light on market linkages. It could therefore be useful to explore further the extent to which simulation experiments might identify the potential for price disruptions and the market linkages that arise from dealers' cross-market hedging requirements.

III. Data requirements and monitoring techniques

1. Introduction

The previous chapter divided central bank interest in derivatives market activity into two broad categories. The first category centred on acquiring an understanding of the relationship between derivatives market activity and the economic environment in which central banks conduct monetary policy. Such an interest implies a central bank demand for data that will enable monetary authorities to improve their capacities to monitor economic conditions. The second category is related to central banks' interest in the promotion of financial market stability. The discussion suggested that financial market stability may be enhanced by measures that increase the transparency of derivatives markets and of firms' trading and risk management activities in these markets. Both enhanced public disclosure by market participants of their trading and risk management activities and the collection and dissemination of data on the size and the distribution of risk exposures in derivatives markets are important to central banks and market participants for assessing potential macroprudential risks in derivatives markets.

The following sections consider the data that would be useful for addressing these interests. The discussion suggests that many of the information requirements of central banks regarding derivative markets activities can be addressed by appropriately constructed market size data. Such data would include selected turnover figures, and the notional amounts and market values of stocks outstanding. To be most useful, the data should be collected with fairly detailed breakdowns as to underlying market risk, instrument type, counterparty type and maturity. However, these considerations must be balanced against the costs and feasibility of collecting the data. Following a discussion of the information needs that can be addressed by market size data, cost and feasibility considerations are discussed.

Some of the information requirements identified in the previous chapter cannot readily be addressed with market size data. This is particularly the case with respect to the potential for derivatives markets to produce disruptive price dynamics and market liquidity problems. To assess this potential, forward looking approaches as opposed to historical data gathering techniques may have attractions. Section 5(ii) below suggests that data generated by firms' internal risk management systems may facilitate monitoring of market functioning and recommends further research in this area.

2. Data requirements related to the macroeconomic implications of derivatives markets

(i) Derivatives activity and the redistribution of price risk

At the most fundamental level, derivatives markets facilitate the transformation of agents' existing risk exposures through the transfer of exposures among counterparties. The scale of risk transfer can be inferred from market size data on both the value (notional and market) of outstanding contracts and the volume of transactions in new contracts (turnover). To adequately measure the transfer of risk in derivatives markets, the data should include the following:

- the specific type of underlying market risk being transferred (e.g. interest rate risk or exchange rate risk);
- the type of derivative product used in the risk transfer (distinguishing at the minimum between forward- and options-based products);
- the counterparties among whom risk is being transferred;
- the notional amount and market value of the contract;
- the remaining maturity of the contract.

In order to shed light on the price risk transfers facilitated by derivatives markets, market size data must be collected according to relatively detailed underlying price risk categorisations. Derivative contracts that have implications for the redistribution of interest rate and exchange rate risk exposure between economic agents are likely to have the largest effects on the monetary transmission mechanism and are therefore of particular interest to central banks. The assessment of economic and financial conditions could also benefit from data on the transfer of other important classes of market risk, such as equity or commodity risk.

Aggregate data on the scale of risk transfer undertaken in derivative markets would clearly be enhanced if the data identified the classes of counterparties or economic sectors among whom risk is being shifted. From the perspective of monetary analysis, a breakdown between the bank or financial sector and the non-financial sector at a minimum would be beneficial.

Market size statistics on the notional and market values of contracts outstanding as well as on the volume of transactions in new contracts (turnover) can shed light on the scale of risk transfers. Notional amounts can provide a very rough measure of the transfer of market risk, and also provide a comparable measure of market size relative to cash market instruments that can have similar price risk exposures. Market values (positive and negative gross market values) reflect the economic value embodied in outstanding risk transfer contracts at current market prices and provide a measure of the

economic significance of the wealth transfers that these contracts entail. The remaining life of contracts provides some indication of the possible future wealth transfers.

The fact that derivatives contracts differ in their economic functions and risk characteristics means that market size statistics should contain detail about contract types. A distinction should be made at the minimum between forward-based and option-based derivatives. Forward-based instruments, such as swaps and futures, generally share the properties that their market values are linearly related to the prices of underlying instruments and that the risk transfers they facilitate are proportional to the notional amount of the contract. These properties do not hold for options-based contracts. The non-linear nature of an option's value and sensitivity to underlying risk factors means that the notional amounts of forward-type and options contracts cannot be meaningfully aggregated. The risk transfer accomplished with simple options can be better compared with that in cash or forward markets by weighting the notional amounts of the former by their hedge (delta) ratio. Delta-equivalent values also provide insight into the degree of dispersion of strike prices underlying outstanding options contracts.

Additional detail on contract characteristics would provide useful information on the nature of price risks transferred in derivatives markets. For example, the market risk transformation achieved by means of a five-year floating/floating interest rate swap (basis swap) is fundamentally different from that achieved by means of a five-year fixed/floating interest rate swap. In the first case, the basis swap allows market participants to hedge the risk of movements between two similar but not identical short-term interest (e.g. 3-month Euro versus 3-month Treasury bill rates), while the second swap involves transferring a money-market risk exposure into an interest rate exposure equivalent to that of a 5-year bond.

3. Data requirements from the macroprudential perspective

(i) Data on the scale and distribution of credit exposures in derivatives markets

The market value, or replacement cost, of outstanding contracts is of primary relevance for measuring the size and distribution (concentration) of credit risks in over-the-counter derivatives markets. In isolation, a derivative contract generates a credit risk exposure for its holder when the contract has a positive market value. A firm's total counterparty credit risk exposure generated by its derivatives activities depends on the extent to which offsetting contracts can be netted in the event of defaults. If netting is legally enforceable, the appropriate measure of the firms' credit risk exposure is the

net positive market value of the derivatives portfolio (i.e. the positive market value after netting, inclusive of collateral arrangements).

If the above data were categorised by counterparty type, they could be used to calculate broad measures of the distribution of credit risk exposures among derivatives dealers and between derivatives dealers and end-users. Such data would provide information relevant to assessing potential concern about the concentration of credit risks among counterparties in derivatives markets. To the extent that credit risk is found to be concentrated within the dealer community, it is also of interest to know whether these dealers are owed funds by a small or large number of other counterparties. This would require firms to report the net negative market value of their derivatives portfolio, broken down as between credit extended to other dealers and to end-users.

(ii) Information required for assessing market liquidity

Traditional measures of the liquidity of a market focus on transactions data. In concept, market liquidity measures the sensitivity of the relationship between the size of a transaction and its effect on market prices. A direct measure of the immediate liquidity of a market is the size of transactions that can be undertaken at the indicated market bid and ask prices (i.e. the depth of the market). A more complete measure of liquidity would estimate the price elasticity when trade sizes exceed indicated market depths. Unfortunately, such data and elasticity estimates are not available (indeed they are not even available with accuracy for exchange-traded financial instruments). However, turnover data, or the volume of transactions per unit of time, may serve as a very rough proxy measure of market liquidity. Another indirect measure of market liquidity is the number of active market-makers for a particular type of market or transaction.

The appropriate measure of the volume of trade depends on the type of contract in question. For swap and other forward-type contracts, market value is typically zero at initiation. For such contracts, the volume is naturally measured by the notional amount of transactions per unit of time. However, the total volume of notional amounts alone is not sufficient as a measure of liquidity. Two markets could have the same measured notional turnover per unit of time and have very different trade size, frequency and liquidity characteristics. For example, liquidity in markets in which an average of 100 million in notional amounts is traded in a single day may differ according to whether this number was generated by 1 trade of 100 million notional amount or 100 trades of 1 million notional amounts.

For turnover statistics, it would be informative to collect the notional amount of transactions per unit of time, the number of transactions within a time period, and some information about the size-distribution of trades within a time period. Such information would convey a more representative picture of the size and frequency of trading activity in the market, provided the turnover data are collected for specific product types and price risks.

In the case of options, notional amounts can be used to track the size and growth of markets over time, but not to measure risk transfer in these markets. As noted earlier, a more appropriate measure of risk transfer for simple options is their delta-weighted notional value since this takes into account the extent to which they are "in-the-money". However, unlike swap and other forward-type contracts, option-type contracts have value at initiation. This value is equal to the premium paid to the writer of the option. An alternative measure of activity in options markets would therefore be the sum of premia paid for newly initiated transactions in a given period. An advantage of this measure is that it is comparable across simple and more complex options.

Market concentration statistics could be calculated as a by-product of a survey to collect turnover data. The detail of the market definitions used in a turnover survey would determine the detail at which market concentration can be measured. The level of transaction-specific detail at which market concentration should be measured is a priori unclear. Measures of market-making concentration could be defined in terms of specific instrument classes. The rationale supporting detailed market definitions is that many investors may use only a subset of derivative instruments to trade and hedge risk and they may be unable to switch immediately to other instruments that provide similar hedging profiles. To the extent that market participants are constrained to view markets as segregated, measuring dealer concentration for narrowly defined instrument categories is important. Only if market participants are freely able to substitute among derivative instruments should market concentration be measured at a more aggregate level. If measured at a more aggregated level, market categorisations should be defined broadly enough to include all instruments that are typically used to trade a fundamental market risk factor.

4. Considerations bearing on the construction of market size statistics

In considering the design of a data collection system for market size statistics, central banks must balance desirable features of the data to be collected against the cost and feasibility of collecting them. The following sections discuss the various trade-offs that enter into these considerations.

(i) Alternative approaches to market coverage

The "proper" definition of what constitutes a market depends on the purposes for which the market is being measured. For example, the relevant definition of a market for purposes of measuring the broad categories of risk intermediation is likely to differ from the definition of markets that is appropriate to measure the effects of derivatives markets on maturity transformation in interest rate markets. From a practical perspective, gathering data on markets which are delineated by very detailed categorisations would increase the burden on reporting participants.

A detailed approach to defining a market would entail the collection of data on (potentially many) specific contract characteristics in addition to a broader instrument categorisation. For example, under a detailed approach, the definition of a cross-currency interest rate swap market might include: both defining currencies, a contract maturity range, the terms of the contract that apply to each currency leg (fixed or floating) and whether a non-reporting contract counterparty is a financial or a non-financial firm. For options and forward product categories, this approach would make a distinction between contracts that are exchange-traded and those that are traded over-the-counter, and whether the contract terms require an exchange of principal.

An alternative approach would be to define a market more broadly. Under this approach, a market might be defined by a broad instrument category, an underlying market risk factor (i.e. an interest rate, currency, equity or commodity market designation), and the remaining contract maturity. A broad approach might not distinguish whether a contract is traded on an exchange or over-the-counter, or whether the contract requires an exchange of principal at maturity. Under such an approach, the definition of, for example, a currency swap might only include one of the underlying currency legs, and a maturity breakdown. Hence, only total dollar or total DM swap positions would be measured, but the size of the individual cross-currency markets would not.

Some specific examples may help to clarify the differences in the information content of the data produced by these alternative approaches. The following examples highlight information that is attainable under the detailed approach but lost under the more aggregate approach to defining markets.

- Currency swaps are used to transfer short funding risks. For example, a firm or bank operating in the Yen market may raise capital in the short-term US dollar market and wish to hedge the exchange rate and interest rate risks of its US dollar denominated liabilities. A measure of the aggregate size of these risk transfers would be useful for macroeconomic purposes and would help explain issuance patterns in traditional cross-border financial instruments.

- Obtaining insight into the role of derivatives markets in maturity transformation would require a distinction between contracts that hedge short and long-term interest rates. If all interest rate contracts are reported as a single category (i.e. not distinguishing between the maturities of contracts), such information is lost. Market size statistics that capture contract detail, such as options that are used to place ceilings on interest payments, might also be useful in explaining borrowers' motivations in their choices of floating rate sources of finance.
- A final example involves separate versus aggregated data on exchange-traded and OTC contracts. The separate collection of data on the exchange-traded contracts held by derivatives dealers will provide information on an important source of linkages between these markets. In unusually volatile market conditions, the hedging of residual portfolio risks arising from OTC derivatives may funnel sharp increases in volume to exchanges. A comparison of position sizes in OTC markets with normal exchange volumes may provide some rough indication about the potential adequacy of liquidity in exchange-traded markets.

Although the richness of the information content clearly depends on details used to define a market, not all markets are sufficiently important globally to merit a detailed market definition. Such considerations suggest that the level of detail used to define a market segment could vary across markets. The volume of statistics generated by a detailed definition of markets would argue for limiting detailed market coverage to the most important vehicle currencies (for example, US dollar, Deutsche Mark and Japanese Yen) and to consider only such details as are needed to capture broad measures of risk transfer taking place in other currencies.

(ii) Reporting burden and firms' internal data systems

The extent to which detailed information can be collected will depend on whether it can be readily produced by the information systems of reporting firms. Preliminary discussions with some market participants suggest that modern risk management systems are organised around market risk-factor categories. Details of contracts that give rise to exposures to individual risk factors might not be integrated into risk management data bases. Hence, if the data are supplied to central banks from firms' risk management systems, the burden of reporting may fall but the level of detail that can be obtained could be limited.

Reporting burden considerations are also important when considering the collection of data on the market value of outstanding contracts. A practical consideration in this regard is that, whereas notional amounts are likely to be retrievable from a data base that records historical contract characteristics, market value might not be recorded in the same data base. In order to estimate market values, the firm might

use a separate risk management system. Although the risk management function will require information on the size of exposures in particular markets and risk categories, it may not require very detailed information concerning how such exposures came into being.

Aside from risk management systems, firms maintain data bases that facilitate credit analysis and pay-and-collect accounting functions. The existence of these data bases suggests that firms have the capacity to report market statistics on a relatively detailed basis. However, although the data no doubt exist within a firm, the use of multiple data bases maintained by individual firms may increase the cost for them of participating in central bank data collection initiatives.

Given that market participants' information systems evolve in the light of changing commercial needs and risk management techniques, the accommodation of central bank reporting requirements might be facilitated over time if such requirements were announced and explained well in advance of the implementation of a reporting system. The Working Group is therefore of the view that the level of detail of data requests, taking the scope for systems development into consideration, should be determined in close consultation with market participants.

5. Other monitoring techniques

Although the information requirements of central banks can to a considerable extent be addressed by appropriately constructed market size data, additional information on both macroeconomic and macroprudential issues may be drawn from direct market monitoring and possibly the aggregation of data obtained from standardised simulation exercises.

(i) Direct market monitoring

The infrequency and delay with which statistical data become available imply that they may be of limited use when assessing the functioning of derivatives markets under particular, often rapidly changing, circumstances.

Real-time screen-based price data offer the advantage of being directly available for exchange-traded derivatives contracts and for certain "plain vanilla" OTC products such as fixed/floating interest rate swaps or OTC options on the principal exchange rates. In normal conditions, such data can be useful for a variety of purposes. For example, observations on the level of spreads in these markets may provide a benchmark against which liquidity developments in these markets can be assessed, and

price data from options and forward-based derivatives markets may enrich the assessment of foreign exchange and interest rate developments. However, screen-based price data typically lack reliability during periods of stress.

With regard to the monitoring of market linkages and price dynamics, high frequency data on price correlations and volatility could be useful for central banks and market participants alike. The increased availability of such data through electronic media has lowered the cost of monitoring such information.

(ii) Simulations

Highly aggregated market statistics shed limited light on how market values might change in the face of shocks to market risk factors. This is in part because, for options and other instruments with embedded options, the relationship between market values and risk factors is highly non-linear. Historical market statistics are also of limited use in projecting the strength of market linkages. Because markets are affected by hedging strategies and arbitrage opportunities, market linkages are complex and likely to vary in strength over time. The development of new instruments and trading strategies may have altered patterns of inter-market trading and thus the strength of inter-market correlations. These complexities reduce the information content of historical statistics on volume (notional amounts or market values) for identifying the potential for contagion between markets. This is especially true if data are only collected infrequently.

A potentially fruitful approach for monitoring the strength of market linkages could involve the use of data generated by firms' internal risk management systems. For example, a standardised simulation exercise involving major derivatives dealers could reveal the existence of hedging overhangs associated with, for example, strike price concentrations in OTC options markets. However, further consideration of a simulation-based approach must be preceded by solutions being found to a number of issues. These include the assumptions that should be made as to the statistical distributions from which exceptional market moves are assumed to have been drawn, the criteria that can be applied in judging the capacities of individual firm's models to assess accurately the consequences of exceptional market moves, and the circumstances under which the model results reported by individual firms can be aggregated in a meaningful way. Separately, careful consideration will need to be given to the disclosure of aggregated results.

IV. Recommendations for data gathering

The proposals for data collection presented below reflect, on the one hand, the information needs and data requirements identified in the previous chapters and, on the other hand, the need to consider the reporting burden on firms.

1. Collection and dissemination of global market size data

The analysis in the previous chapters, coupled with an examination of existing data collected by central banks and by market organisations (see Annex III), led the Working Group to conclude that it would be advisable for central banks to expand their collection of data on derivatives markets. An internationally coordinated approach to the collection of these data would aim in the first instance to shed light on the size and structure of the global OTC derivatives markets. If appropriately constructed, these market statistics would enhance central banks' understanding of OTC derivatives markets. This dissemination of the statistics would also, together with other initiatives (notably on public disclosure), contribute to greater market transparency. Direct central bank involvement in the collection and compilation of the data would enhance the meaningfulness, reliability and international consistency of the statistics, and would ensure that central banks have access to the underlying data for further analysis.

Important considerations in this regard are that the data currently published by market organisations cover only a limited number of markets and are focused exclusively on notional amounts. The data gathered by central banks or supervisory authorities are largely aimed at monitoring banks' derivatives exposures for capital adequacy purposes. Although such data have occasionally been used to derive national statistics on the off-balance-sheet activities of the banking system, the data differ in a number of respects from the recommendations in this report and cannot be aggregated comprehensively on an international basis. The ability to aggregate statistics internationally is important, given the global nature of derivatives markets. Since not all the main derivatives dealers are banks, comprehensive market statistics would also have to include data on the activities of non-bank financial intermediaries, such as securities firms and insurance companies.

With regard to the collection of market size data, the Working Group recommended two complementary monitoring techniques: (i) occasional surveys of large numbers of intermediaries to obtain broad scans of derivatives market activity, to be held in conjunction with the existing Survey of Foreign Exchange Market Activity

(every three years); and (ii) a system of regular market reporting (twice a year or quarterly), confined to the main intermediaries in the derivatives markets.

The object of the surveys and regular market reporting would be to provide internationally consistent data at a fairly high level of aggregation that would facilitate efforts by central banks, other regulatory authorities and market participants to monitor the structure and growth of global derivatives markets over time. There are limitations with regard to the degree of detail that can be generated by such global statistics. To the extent that greater detail is required for domestic policy purposes, more detailed information gathering by individual central banks, at their own initiative, could be considered. For example, national central banks may require more information on contracts involving their own currencies and interest rates than can be covered in a global market reporting system. Such national initiatives would not necessarily require a standardised approach.

The Working Group considered that regular market reporting would have advantages over infrequent surveys in facilitating a more timely monitoring of developments in derivatives markets; and, by concentrating on the largest firms in markets which are reported to be relatively concentrated, regular market reporting should achieve a significant market coverage with a smaller number of reporting institutions. Nevertheless, the survey will have a number of important advantages: it will provide a broad scan of the scale and structure of participation in global derivatives markets; it will yield data on turnover in OTC and exchange-traded derivatives markets, including contemporaneous data on cash foreign exchange market transactions; and it will bring forward the time at which globally comprehensive market information will become available.

(i) Occasional surveys among a broad group of intermediaries

The Working Group recommended that advantage be taken of the next Survey of Foreign Exchange Market Activity planned for April 1995 to conduct the first survey of a large number of intermediaries in derivatives markets. This approach has been approved by the Governors of the central banks of the G-10 countries and so source data for global market size data will become available in the course of 1995.

The foreign exchange market surveys have proved useful not just to officials but to market participants themselves. Since most large banks and securities firms in the twenty-six participating countries are expected to take part, the coverage of market intermediaries would be more comprehensive than is envisaged for regular market reporting. The outcome of the survey would, inter alia, help determine which derivatives dealers would be candidates for such reporting.

Since the survey will be carried out on a locational basis, the data will shed light on the international distribution of derivatives trading. Experience with the foreign exchange survey suggests that the publication of aggregate data on turnover and stocks outstanding in derivatives markets will be welcomed by market participants. However, the collection of turnover data involves costs for reporting institutions, since they are not in general collected for internal purposes. This suggests that surveys that collect turnover data should only be held infrequently.

Measurement concepts

The Working Group recommended that the surveys collect data on turnover and stocks outstanding. Turnover would be measured in terms of notional amounts for swaps and forward-type contracts and in terms of notional amounts and the sum of premia paid for options transactions. Notional turnover amounts would capture the relative scale and growth of activity within specific market segments and provide rough measures of market risk transfers within these segments that are comparable with transactions in underlying markets. The additional collection of options premia facilitate comparison across simple and more complex contracts and can be used as a proxy for delta-weighted measures to shed light on the transfer of price risk in these markets.

Stock data would be measured in terms of notional amounts and the gross market value of outstanding contracts at current market prices. Gross market values will provide a measure of market size that is readily comparable across segments as well as with the balance-sheet data collected by central banks on other financial market activity. It will also provide a useful measure of the economic significance of derivatives markets and could instructively be compared with notional amounts outstanding over time. Both positive and negative gross market values will be collected to enable the calculation of measures of market size (see Annex I).

Turnover data may serve as a rough measure of market liquidity. They may also be used to gauge the share of individual dealers in aggregate market turnover, and thereby to shed light on market maker concentration. Turnover data will be limited to a one-month period (i.e. April 1995). This will limit costs and be consistent with the methodology of the foreign exchange survey. The stock figures will relate to the beginning of the survey period (i.e. end-March 1995) since, in many countries, this coincides with the end of a quarterly accounting period.

Breakdowns in market size data

Market risk and currency breakdowns. The Working Group recommended that derivatives business involving foreign exchange, interest rate, equity and commodity products (including precious metals) should be surveyed. Central banks will request a greater level of detail on foreign exchange and interest rate markets in the light of their monetary and macroprudential policy responsibilities.

In order to contain the reporting burden, the Working Group recommended that for stocks outstanding all participating institutions should be asked to provide currency breakdowns only on the principal currencies and currency pairs (US dollar, Deutsche Mark and yen). For turnover data it was agreed to use the same currency breakdowns as in the 1992 Foreign Exchange Survey. Data on derivatives transactions involving US, German and Japanese interest rates - and US, European and Japanese equity price indices - will also be collected globally. Following the practice of the foreign exchange survey, individual central banks could collect additional information, for example on domestic currency and interest rate products from participants in local markets.

Geographical and counterparty breakdowns. In order to eliminate double counting, as well as to provide some information on the structure of trading, reporters would be requested to provide separate information both on local and cross-border transactions and on the distribution of transactions between "dealers", "other financial institutions" and "non-financial customers."

Instrument-type and maturity breakdowns. In order to shed light on the structure of risk transfer in derivatives markets, the Working Group recommended that data should be collected on the following broad instrument categories:

- OTC forward contracts
- OTC swaps
- OTC options
- Exchange-traded futures
- Exchange-traded options

The notional amount of outstanding OTC contracts will be reported by remaining maturity (in the case of turnover remaining maturity equals original maturity in most cases). For stock data, three time bands are requested: under one year, over one year and up to five years and over five years. For turnover data the same time bands are used as in the 1992 Foreign Exchange Survey, i.e. up to 7 days, 7 days to 1 year and greater than one year.

Implementation

The Working Group designed reporting forms for a Survey of Foreign Exchange and Derivatives Market Activity to be conducted in Spring 1995 (see Annex II). Preparation of the forms involved interaction with market participants, particularly regarding the types of information that they would find useful if they were to be published in aggregate form and the practicality of providing the information requested.

(ii) Regular market reporting

To be able to monitor developments in the derivatives markets over time, the Working Group recommended that central banks should collect and compile market size data regularly, for instance twice a year or quarterly. Reportedly, there are relatively few large market-making firms in global derivatives markets. If this is confirmed by the first market survey, regular market reporting could involve no more than 50 firms. Data obtained from these firms on a consolidated basis should provide reasonably accurate information on the size and structure of the global derivatives market. The burden associated with consolidated reporting would clearly be less if information could be obtained from internal data bases. The prospects of this being the case are much better for outstanding contracts on a particular date than for turnover data during a period. The Working Group therefore suggested that the market size data obtained through regular market reporting should be confined to stocks of outstanding contracts.

Measurement concepts

The Working Group recommended that - besides the notional amount - the gross and net market value of stocks outstanding should be collected. For options, it was also suggested that data on the notional amount weighted by the hedge ratio (delta) should be collected. This would shed light on the degree of dispersion of strike prices and, for simple options, provide a basis for comparison with activity levels in underlying cash and forward markets.

For all contracts, notional amounts (delta-weighted for options) and gross market values (positive and negative) would be collected to measure market size, as well as the wealth transfers engendered by derivatives trading. It was proposed that consolidated net market value data (i.e. taking account of netting arrangements) should be collected in order to establish the distribution of credit risk exposure among participants.

Breakdowns in market size data

The data described above could be collected with varying degrees of detail. The Working Group agreed that the data should at least reflect broad categorisations by underlying risk factor (currency, interest rate, equity and commodity) and type of instrument (forwards, swaps and options). The data should also be partitioned by reporting and non-reporting institutions in order to enable the elimination of double counting. There should also be a breakdown of notional amounts by remaining maturity of contracts outstanding. Such information would give an indication over time of the significance of various derivative instruments in the process of risk transformation within broad market risk categories, and could also be used for deriving various measures of concentration of firm involvement within broadly defined markets.

Subject to reporting burdens, the Working Group concluded that it would be desirable to explore with market participants the feasibility of collecting more detailed data than described in the previous paragraph. This higher level of detail would aim to capture information on the specific market risks transacted (such as specific currency pairs or fixed versus floating interest rate risk), as well as a richer breakdown by counterparty type. By providing information on the size of specific market segments, it would become possible to analyse concentration issues within these segments. Besides the collection of data on OTC transactions, it may also be desirable to collect data on reporters' exchange-traded derivatives transactions. Data on dealer participation in exchange markets would provide information on the linkages between OTC derivative markets and exchanges.

The level of detail with which the above-mentioned data could be collected will to an important extent depend on the capability of the internal information systems of the reporting institutions. As the information systems of market participants are modified to accommodate their own evolving commercial and risk management needs, the accommodation of central bank reporting requirements - even if burdensome at present - is likely to be facilitated over time. Since the design and implementation of a final reporting system is likely to take some years, the Working Group was of the view that the level of detail requested should take account of the likely evolution of firms'

systems' capabilities. The Working Group also recognised that the reporting format should, if necessary, be modified in the light of changing market conditions.

Implementation

The Working Group recommended that the technical features of regular market reporting should be developed in close consultation with market participants and central bank statisticians. In order to contain the reporting burden, the Working Group recommended that implementation of a reporting system should be coordinated with bank supervisors and, as appropriate, other financial sector supervisors. The Working Group felt it was essential that these dialogues should begin as soon as is practical to bring forward in time the date at which regular market data will become available.

2. A forward-looking monitoring technique

Highly aggregated market statistics shed limited light on how market values might change in the face of shocks to market risk factors. Historical market statistics are also of limited use in projecting the strength of market linkages. A potentially fruitful approach for monitoring market linkages and price dynamics engendered by derivatives trading could involve the use of data generated by firms' internal risk management systems. For example, a standardised simulation exercise involving major derivatives dealers could reveal the existence of strike price concentrations in OTC options markets. Such an approach may provide a less burdensome way of yielding meaningful data for monitoring the possible implications of derivatives market activities for financial market functioning. The Working Group recommended that central banks support research in this field through collaborative efforts.

General overview of measurement concepts and monitoring techniques

Perspective	Interest in	Requires data on	Concepts of measurement	Breakdown of market size data by*	Monitoring techniques
Macroeconomic	Transfer of market risk	Market size by risk category	Turnover: notional Stocks: notional and gross market value (positive and negative)	Market risk: currency interest rate equity commodity Product types Maturity of contracts	Survey: turnover and stocks. Regular market reporting: consolidated stocks only
	Transformation of sectorial risk exposures	Market size by risk category and end-users		Counterparty-types (e.g. reporter, other financial and non-financial)	
Macroprudential	Concentration of market making and market liquidity	Market size and share of market makers Real-time prices and volumes	Turnover and stocks Spreads, number and size of trades	Market segment and individual products within broad market risk categories listed above	Survey Regular market reporting Direct monitoring
	Concentration of credit risk	Market size and counterparty types	Stocks: net market value (positive and negative)	Aggregate credit risk exposures: interdealer, dealer/other financial, dealer/non-financial (arising from derivatives activities only)	Regular market reporting
	Market linkages	Funding/hedging strategies of dealers/end-users that span markets Hedging demands: volume effects	Turnover and stocks Simulated flows	Market segments and specific products that span markets (e.g. cross-currency interest rate swaps)	Survey Regular market reporting Coordinated simulations
	Price dynamics	Real-time prices and volumes (distribution of strike prices) Hedging demands: price effects	Spreads, number and size of trades. Distribution of strike prices Simulated flows		Direct monitoring Coordinated simulations

* Survey envisages a breakdown by the main currencies and interest rates (US dollar, Deutsche Mark, Japanese yen), product categories, (forwards, swaps and options) and by the remaining maturity of contracts: up to one year, one to five years and five years and over. Counterparty breakdowns in the survey follow the methodology of the present Survey of Foreign Exchange Market Activity. For regular market reporting, the market category definitions and counterparty breakdowns are to be developed in consultation with market participants and central bank statisticians.

ANNEX I

Statistical Methodology

Table of contents

	Page
1. Some general considerations on the collection of stock and flow figures	1
2. Measuring market size and credit risk from consolidated data on outstanding stocks.....	5
(i) Notional amounts	5
(ii) Market value.....	7
(iii) Aggregate credit exposure	7
(iv) Distributions of credit exposure	8
3. Measuring market size from locational survey data.....	8
(i) Consistent measurement of turnover from location-based survey data.....	9
(ii) Consistent measurement of amounts outstanding from location-based survey data	12
(a) <i>Notional amounts outstanding</i>	12
(b) <i>Market value of contracts outstanding</i>	14

Statistical Methodology

Introduction

This Annex sets out statistical methodologies for the compilation of global derivatives market size data based on reported stock figures and turnover data. Methodologies appropriate for this purpose are provided for data reported by firm groups on a consolidated basis and for data reported by individual firm affiliates on a locational basis. The recommendations discussed in Chapter IV with regard to regular market reporting and occasional surveys are based on this analysis but may differ in some respects reflecting cost and feasibility considerations. Where appropriate, separate sections in this annex deal with aggregation issues specific to the nature of the underlying data reported (e.g. notional versus market value data).

1. Some general considerations on the collection of stock and flow figures

The size of global derivatives markets can be measured in terms of either the stock of outstanding contracts or the flow of new contract volume per unit of time. The turnover of derivatives can best be established by surveying new business flows at market participants, but could also be approximated by changes in reported stocks-outstanding data if these were collected with high frequency. The co-operative Central Bank Survey of Foreign Exchange Market Activity is an example of a direct survey approach to measuring market turnover. The Survey is carried out on a locational ("location of trade") basis. Such a survey basis facilitates the compilation of local turnover statistics, thus providing national authorities with data on local market activity. Provided appropriate counterparty location breakdowns are available, locational surveys also provide source data for the compilation of global turnover figures. Global turnover data can also be compiled from data reported on a consolidated basis (whereby a central office would report the sum of new contracts entered in a given period in all the locations in which affiliates are active). However, consolidated turnover data could not be used to compile national turnover figures unless reporters indicated the locations in which transactions were carried out.

The collection of data on the value of outstanding contracts may be undertaken by a survey that collects data on a location basis from all market participants transacting in a given location, or alternatively, on a consolidated basis where only the central office of an affiliated group of firms reports the positions of the group. Accurate measures of the global size of stocks outstanding based on locational surveys would require participation from virtually all important market centres. By contrast, in a

consolidated reporting framework, the participation and co-operation of all major market centres is not necessarily critical. To the extent that the affiliates of the consolidated reporters have a significant presence in most major market locations, reasonably accurate market size estimates can be obtained with fewer participating locations and less international co-ordination. Since the market making function in derivatives markets is reportedly provided by a limited number of firms that possess the capital, technical knowledge and information systems capacity to manage global trading books, substantial market coverage can be achieved by collecting consolidated market value data from the main dealers on a regular basis. Consolidated stock reporting would also have the advantage of providing data on the global derivatives activities of institutions by the country (legal jurisdiction) of incorporation of their headquarters.

Aside from issues of international co-ordination, practical considerations suggest that meaningful aggregate measures of the notional amounts and market values of outstanding contracts are most easily estimated from data reported on a consolidated firm basis. To accurately correct for double-counting in the aggregation of consolidated data, it is sufficient that the reported data are partitioned according to whether counterparties are respondents or non-respondents. This can be accomplished by distributing a list of respondents to all survey participants. By contrast, if the global stock data are to be compiled from surveys conducted on a locational basis, the data must be further categorised according to the location of a contract's counterparty. In comparison with consolidated data collection, therefore, a location-based survey requires a more detailed partition of the data that is to be reported, as well as a much larger respondent list.

Importance of firms' record-keeping systems

When designing an approach to collect market statistics, it is important to consider the internal record-keeping systems of respondents. In general, firms do not keep a record of their volume of transactions per unit of time in the derivative products they trade. Rather, as transactions are verified, they are recorded on the books of the firm either as a separate contract obligation, or possibly as an addition to the net amount of outstanding contracts if the transaction is recognised under a master netting agreement. Although firms clearly do maintain records of contract obligations, firms may maintain these records separately in affiliated offices, or on a consolidated basis. Industry practice is moving toward consolidated accounting and market risk monitoring, but at present, relatively few dealers have the capacity to report consolidated books and market positions without considerable time and manual account consolidation.

At some level, firms do have a record of the stock of transactions in which they have an obligation or interest. These records will change both as new deals are transacted and as existing contract obligations mature. When transactions are reversible, subject to master agreements that allow for intra-period netting, or when contracts are of short maturity, accurate estimates of turnover data cannot be recovered from changes in the notional amount of outstanding contracts unless these data are reported at very high frequency. In practice, however, the frequency of comprehensive report preparation on consolidated derivatives market positions is likely to be low relative to the frequency that would be necessary to accurately measure derivative turnover activity from changes in consolidated notional-amount data. Turnover is also likely to be poorly measured by changes in these data when the market is characterised by frequent and economically meaningful transactions between affiliated dealers (i.e. excluding internal book-keeping transactions).

The nature of derivatives transactions therefore suggests that changes in the notional amount of outstanding contracts are unlikely to be accurate estimates of turnover when notional amounts are measured at a low frequency. Rather, turnover estimates will be more accurate when firms directly record their transactions over a pre-determined interval of time and report these transactions on a location basis. When turnover data have been collected directly in past surveys, firms have made special arrangements to record their volume of transactions in a co-ordinated manner over a pre-determined period of time. Because such a data collection effort is specialised and beyond the scope of internal accounting requirements, participation in such a survey involves costs for participating firms. Consequently, direct turnover surveys can only be conducted infrequently.

In comparison with a direct turnover survey, the collection of data on the notional amounts and market values of outstanding contracts from firm ledgers is an altogether different data collection exercise. Instead of monitoring specific transactions types over a fixed survey period, the firm is asked to report the contracts it has entered into but which have yet to mature. A firm would typically need to reconstruct values from its existing accounting and market risk management data bases. Although this statement is superficially obvious, it is important to consider the possibility that firms monitor their outstanding contracts in different ways.

A firm may be a counterparty to many types of derivatives transactions. However, virtually any transaction the firm undertakes will result in an interest rate, exchange-rate, equity market or commodity price risk exposure. Modern risk management techniques decompose individual contracts into "contract legs" that fall naturally into a distinct risk exposure category. For example, a US dollar fixed-floating

interest rate swap would result in two exposure legs to US interest rate risk factors: exposure to a long-maturity US interest rate and exposure to a short-maturity US interest rate. Similarly, a US Dollar-DM cross currency swap will have a leg that appears as an exposure to US interest rates as well as a leg that is reported in a DM interest rate "book". Although firms are likely to routinely update and monitor risk exposure legs in their risk management system, it is less likely that they produce detailed reports on the specific contract characteristics of the firm's derivatives book with equal frequency.

The nature of internal firm accounting and risk management systems is important in the design of an approach for collecting information on the notional amounts or market values of outstanding contracts. Discussions with the risk management departments of some sophisticated derivatives dealers have suggested that modern risk management systems are easily able to provide market value information if the data requested is grouped according to single "legs" of a contract. The capacity of risk management systems to group contracts in a manner that specifies multiple characteristics of the terms of a contract is likely to be uneven across potential respondents. Such considerations become more important in consolidated reporting efforts. Firms may keep separate transaction-oriented books in subsidiary offices but maintain a consolidated risk management system only in terms of the separate risk exposure "legs" that these separate subsidiary books imply. In order to minimise the burden on reporters, the categorisations of the data to be reported should efficiently utilise the internal risk management and reporting systems of the participating firms.

The following sections outline methodologies for collecting market size statistics from consolidated data and from data collected on a locational basis. Given the practical difficulties inherent in measuring turnover from consolidated data, the locational survey approach is preferable for measuring the market volume of transactions in derivative financial instruments. Given the reporting burdens associated with direct monitoring of transactions volume, location surveys must be infrequent. Although size statistics can be derived from locational survey data, consolidated data surveys are likely to provide a more accurate and practical approach for frequent measurement of the size of derivatives markets in terms of notional amounts and market value.

2. Measuring market size and credit risk from consolidated data on outstanding stocks

This section sets out the statistical methodology for the compilation of the derivatives market size data based on reported stock figures. The methodology assumes that data are reported on a consolidated basis. Separate sections deal with aggregation issues specific to the character of underlying data reported (notional amounts, market value and credit exposure data). A methodology for the estimation of the distribution of risk exposures in derivatives markets is also discussed.

(i) Notional amounts

To avoid double-counting in the calculation of measures of market size, it is necessary that reporters separate the amounts in contracts with other reporters from those with non-reporters.

The measure of market size based on the notional amounts of contracts outstanding:

$$\begin{aligned} &= (1/2) \text{ Sum of the notional amounts of contracts between reporting firms} \\ &+ \text{ Sum of the notional amounts of contracts between reporting and non-reporting firms.} \end{aligned}$$

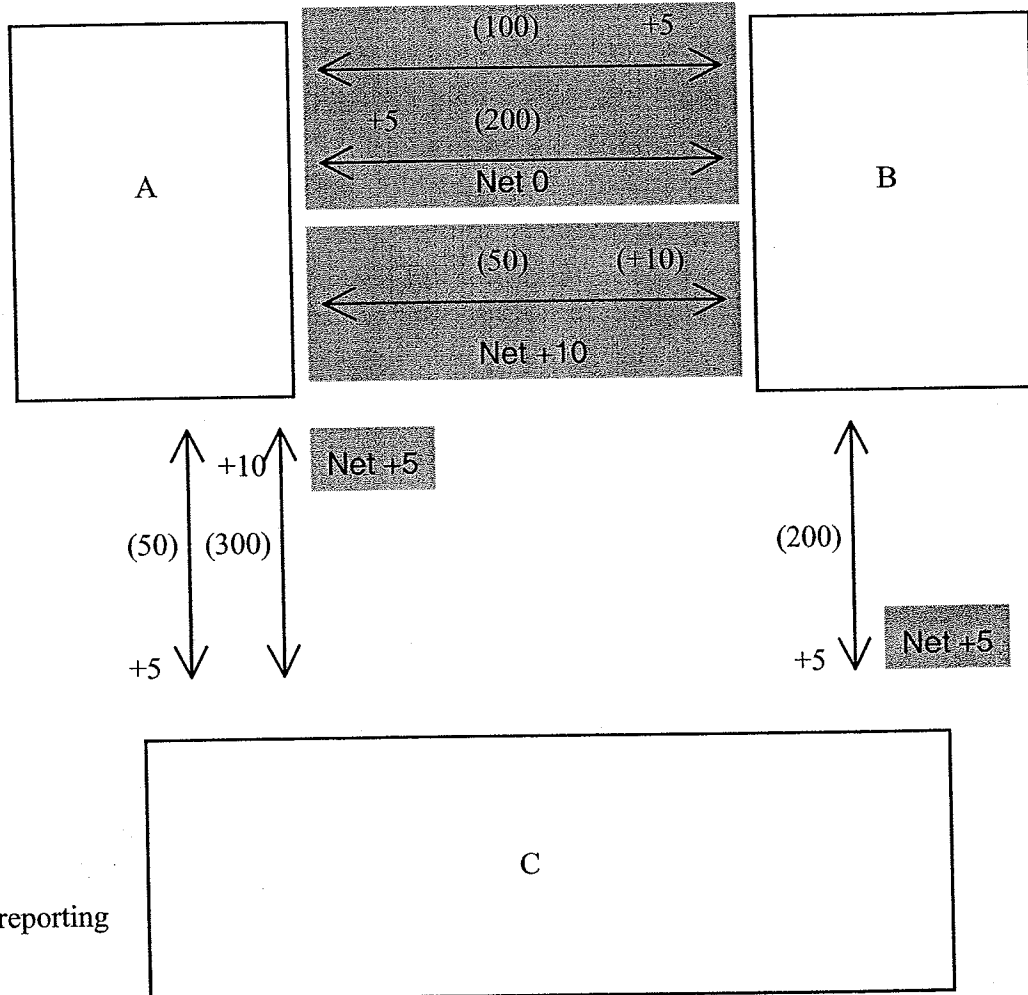
The aggregation of notional amounts is illustrated in Figure 1. In Figure 1, A and B are firms in the reporting panel, and C is a non-reporting firm. In the figure, the arrows represent contracts between the counterparties with notional amounts given in brackets. In this example, there are 6 contracts with an aggregate notional amount of 900.

Applying the reporting scheme described above to the example given in Figure 1, firm A would report 350 in notional contract amount with other reporting firms, and 350 notional contract amount with non-reporting firms. Firm B would report 350 in notional amounts of contracts with reporting firms, and 200 in notional contract amounts with non-reporting counterparties. The aggregate notional amount estimate would be: $(1/2)(350+350)+200+350$, or 900. The calculation is shown at the bottom of Figure 1 (see I). Contracts between non-reporting firms would not be reflected in the market size measures. That is, the calculated measure understates the size of the market by an amount equal to the sum of notional contract amounts among non-reporters. The two other measures discussed in this annex also understate market size, to the extent that they do not reflect contracts between non-reporters.

Figure 1

Measuring total OTC contract values from consolidated data

Reporting firms



I.	Total of notional amount of contracts outstanding	=	<u>900</u>
	1/2 total of notional amounts reported between reporting firms	=	350
	+ Notional amounts with non-reporting firms	=	550
II.	Total market value of contracts outstanding	=	<u>40</u>
	Gross positive market values between reporting firms	=	20
	+ Gross positive market values with non-reporting firms	=	10
	+ Gross negative market values with non-reporting firms	=	10
III.	Total credit exposures between market counterparties	=	<u>20</u>
	Net positive exposures in contracts between reporting firms	=	10
	+ Net positive exposures in contracts with non-reporting firms	=	5
	+ Net negative exposures in contracts with non-reporting firms	=	5

(ii) Market value

If a contract has a positive market (replacement) value for one counterparty, the contract has a negative market value to the contract's other counterparty. Because of this property, if all counterparties were to report, market size could be found either by summing up the gross positive or the gross negative replacement value of contracts across all counterparties.

Because the counterparties to all contracts will not report, calculation of the aggregate market value of contracts outstanding will require that market values be reported separately for contracts in which both counterparties are reporting firms. For contracts between reporting counterparties, aggregate market value is measured by either the sum of all contracts with positive market values (gross positive market value), or the sum of all contracts with negative market values (gross negative market value). The aggregate market value of contracts with non-reporting firms must be calculated as the sum of: all contracts between a reporting and a non-reporting firm with positive market values, and the market value of all contracts between reporting and non-reporting counterparties that have negative market values. Thus the estimate of aggregate market value is:

- Sum of the gross positive market value of contracts between reporting firms
- + Sum of the gross positive market values of contracts with non-reporting firms
- + Sum of the gross negative market values of contracts with non-reporting firms.

The aggregate market value calculation is shown in the bottom of Figure 1 (see II). Under the reporting scheme outlined above, Firm A would report a gross positive market value with reporting counterparties of 5, a gross positive market value of contracts with non-reporting counterparties of 10, and a gross negative market value of contracts with non-reporting counterparties of 5. Firm B would report a gross positive market value of contracts with reporting counterparties of 15, gross positive market value of contracts with non-reporting counterparties of 0, and gross negative market value with non-reporting counterparties of 5. The calculated measure of aggregate market values of contracts is: $(5+15)+10+5+5=40$. This measure will underestimate aggregate market value to the extent that contracts between non-reporters are significant.

(iii) Aggregate credit exposure

To estimate credit exposures outstanding in derivatives markets, gross replacement values must be adjusted for netting arrangements. Each reporting firm

would first calculate the market values of all its contracts. For each counterparty, the firm would then determine which specific contracts are subject to netting arrangements, and calculate the resulting net exposure. The net positive market value of the firm's exposure to that counterparty is the total of all contracts with positive market value that are not netted, added to the positive net market value of contracts that are included in netting arrangements. The total credit exposure of the firm's derivative book is the sum of these net positive market value counterparty exposures across all of the firm's counterparties.

The calculation of aggregate credit exposure is shown in the bottom of Figure 1 (see III). The calculation takes into account the existence of two netting arrangements between the two reporting firms, A and B, one with a net positive exposure of 10 and the other with 0 exposure. The separate coverage of the two netting agreements is denoted by the use of shading. Finally, the calculation of the market measure incorporates the net negative exposure of reporting firms to their non-reporting counterparties, taking into account netting arrangements, as appropriate. The sum of these values reflects aggregate net credit exposures outstanding in derivatives markets.

(iv) Distributions of credit exposure

Information submitted by individual reporters on the amount of net negative credit exposures could be used to calculate the distribution of credit received among all reporting firms by grouping, such as nationality. In addition to aggregate data, measures of concentration could be constructed for credit exposures among reporting firms, and between reporting and non-reporting firms.

3. Measuring market size from locational survey data

This section sets out the statistical methodology for the compilation of the derivatives market size data based on reported turnover figures from a location-based survey. In this discussion it is assumed that transactions volume figures are reported by individual offices at various locations. The following sections discuss the counterparty groupings and techniques to be employed in local and international aggregation of survey data.

(i) Consistent measurement of turnover from location-based survey data

It is assumed that turnover data are collected using the direct monitoring method. This method requires firms to record the volume of transactions that occur in specific contract groups or market categories over a set period of time. The volume statistics should include the number of contracts traded, the total notional amount of transactions volume for forward and swap-type contracts, and the total notional amounts for option-type transactions. If transaction volume size distribution statistics are also to be collected, firms would have to keep a record of the size of each individual transaction in the reporting period.

Participating firms must be informed of the specific contract categories for which volume data are to be recorded. Category definitions must be consistent across all participating locations. The survey period must be identical across all locations. Total volume figures must be translated into a base currency volume measure across all reporting locations, preferably according to pre-arranged exchange-rate conventions. The choice of exchange-rate convention will affect the reported figures. A trade-off between accuracy and reporting burden might suggest that contracts traded over a day be converted into a common currency using a common daily exchange rate observation such as the opening or closing exchange rate that prevails in a major market centre.

In order to eliminate double counting in the local and international aggregation, some method must be used to identify the counterparty to a transaction. Transactions must be classified according to whether the counterparty is: a participant in the survey (a reporter) in the same location as the reporting firm; a reporter in an alternative survey location; in another survey location but not a reporter; within the same survey location and not a reporter.

Both for a location and across locations, individual reporters often undertake transactions with affiliates (including other branch offices of parent firms). The counterparty affiliates may also be reporting firms. In order to eliminate "passing-the-book" transactions between affiliates, reporting firms should only include transactions volume with affiliates (either inter- or intra-location) if these transactions are "arms length". That is, firms should report transactions with affiliates only if the terms on such transactions are equivalent to those that would have prevailed in the competitive marketplace at the time of transactions. Arms-length transactions between affiliates should be recorded according to the location and reporter (non-reporter) status of the affiliate.

For purposes of the following discussion, it is assumed that each firm within a location reports contract volume by the aforementioned categories during the designated

reporting period. The estimate of aggregate turnover within the location measured either by the total number of contracts traded or the notional amount of volume in these contracts is given by:

$$\begin{aligned} \text{Local turnover} = & (1/2) \text{ total volume between reporters in the location} \\ & + \text{ total volume with non-reporters in the location} \\ & + \text{ total volume with reporters outside the location} \\ & + \text{ total volume with non-reporters outside the location,} \end{aligned}$$

where volume can refer to the number of contracts traded or the total notional amount of the contract volume recorded depending on the definition of turnover that is being estimated. The total reporter-to-reporter volume within a location is divided by 2 to eliminate double counting.

In order to calculate a consistent measure of aggregate global turnover, the sum of the local turnover figures must be corrected to account for the double-counting of cross-border transactions. Aggregate turnover - or, global turnover net of cross-border double-counting - is measured by:

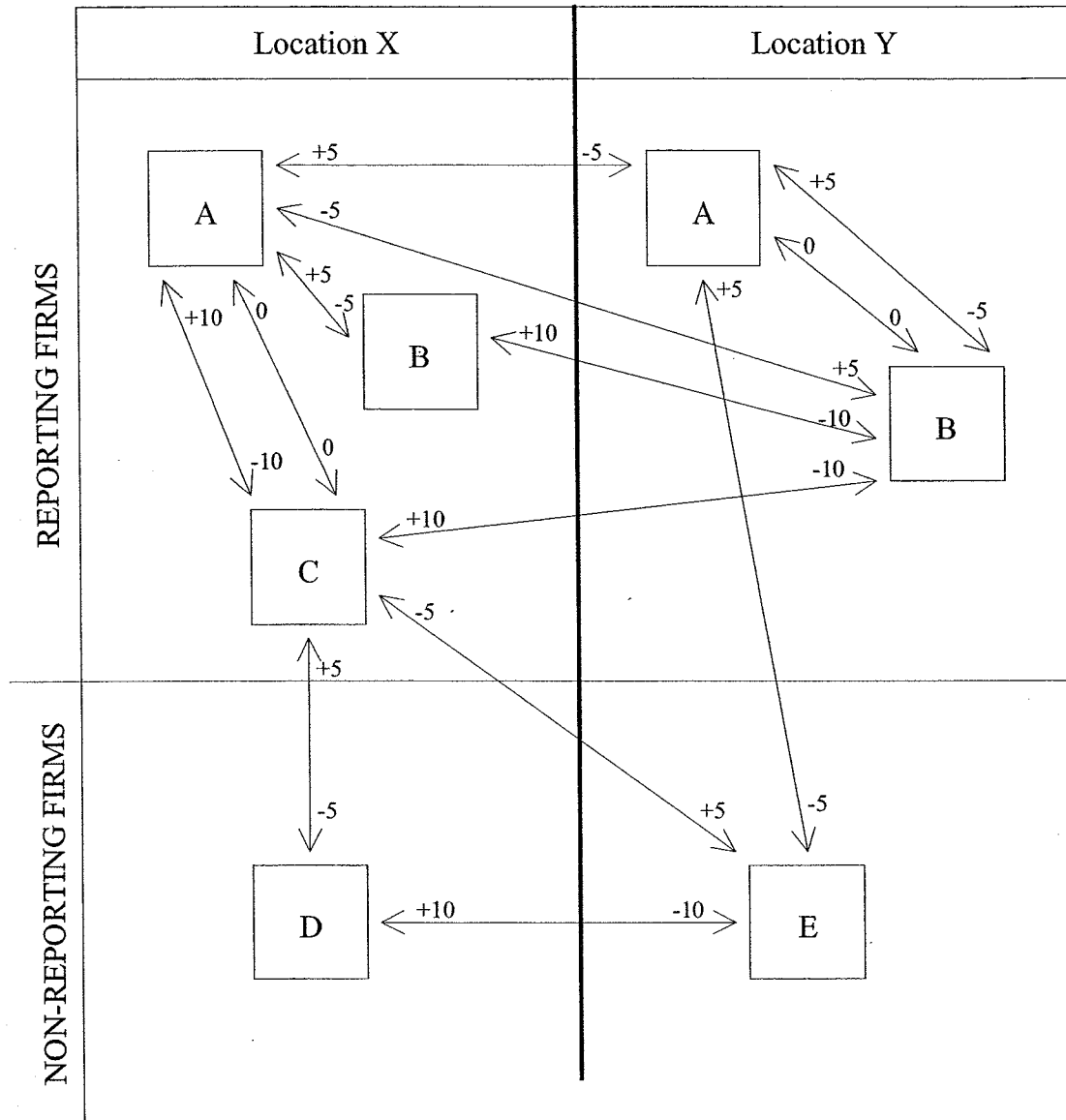
$$\begin{aligned} \text{Aggregate turnover} = & \text{sum of local turnover estimates} \\ & - (1/2)(\text{Sum of cross-location reporter-to-reporter volume}) \end{aligned}$$

This estimate of aggregate turnover applies both when turnover is measured by the number of contracts traded and when it is measured by the total notional amount of the contract volume over the survey period.

The methodology for constructing aggregate turnover statistics from locational survey data is illustrated through a simplified example. Figure 2 represents a simplified world with reporter, non-reporter and affiliate firms in two separate survey locations. Firms A, B, and C are reporting firms in location X. Firm D is a non-reporting firm in location X. Firms A and B also have affiliate firms in survey location Y. In this example, firm affiliates of A and B in location Y are also reporting firms in that location and there are no affiliated firms within a survey location. Firm E is a non-reporting firm in location Y.

Figure 2

Measuring notional turnover and stocks outstanding from a locational survey



Assume all contracts have 100 notional value in a common currency unit.

The total world-wide volume of contracts traded during the period is the number of separate arrows (13). For simplicity, assume each contract has a notional value of 100. In this example the notional volume of contracts is 1300. Assume all transactions between affiliated offices are arms-length transactions.

Exhibit A illustrates the data that would be reported by individual offices, the local turnover calculation, and the aggregate turnover calculation for the world market illustrated in Figure 2. Consider the reports filed by A in both locations. In location X,

A would record volumes of: 300 of transactions with counterparties who are also reporters in X; 0 volume of transactions with counterparties who are non-reporters in location X; 200 of transactions with counterparties that are not in X and are reporters in another survey location; and 0 volume of transactions with non-reporters who are outside the location X survey region. The reported figures of the other firms are also given in the top two panels of Exhibit A.

The bottom two panels of the Exhibit A illustrate the local turnover and the aggregate turnover calculations for notional measures of volume. For location X: the total reporter-to-reporter volume is 600; the total volume with non-reporters also in location X is 100; total volume with other reporters who are not in location X is 400; and the total volume with non-reporters outside of region X is 100. The estimate of local volume in region X is: $(1/2)(600)+100+(400+100)$, or 900. Similar calculations will produce a volume estimate of 700 for location Y. The total cross-border reporter-to-reporter volume is 800, 400 reported in X and 400 reported in Y. The estimate of global turnover net of cross-border double counting is: $(900+700)-(1/2)(800)$, or 1200.

Notice that, in the above example, both local turnover estimates and the estimate of global trading volume understate the true amount biased because they do not include the non-reporter to non-reporter transaction between firms D and E. In practice, turnover estimates will also be understated to the extent that financial transactions occur in regions that are not included in a survey location.

(ii) Consistent measurement of amounts outstanding from location-based survey data

(a) *Notional values outstanding*

The methodology for collecting the notional value of outstanding contracts in a location-based survey is essentially identical to the procedure for collecting turnover data in a location-based based survey. At the individual reporter level, firms must distinguish among the counterparties when they report the notional values of each detailed market category. Notional amounts of contracts outstanding must be classified according to whether the counterparty is: a participant in the survey (a reporter) in the same location as the reporting firm; a reporter in some other survey location; in some other survey location, but not a reporter; within the same survey location and not a reporter.

Exhibit A

Notional turnover value calculation from a locational survey

Reported by offices at location X	A	B	C	Total
Volume with reporters in X including arms-length transactions with affiliates in X	300	100	200	600
Volume with non-reporters in X	0	0	100	100
Volume with reporters not in X including arms-length transactions w/affiliates	200	100	100	400
Volume with non-reporters not in X	0	0	100	100

Reported by offices at location Y	A	B	Total
Volume with reporters in Y including arms-length transactions with affiliates in Y	200	200	400
Volume with non-reporters in Y	100	0	100
Volume with reporters not in Y including arms-length transactions w/affiliates	100	300	400
Volume with non-reporters not in Y	0	0	0

Local turnover net of domestic double-counting

Local turnover = (1/2) Total volume between reporters in location
 + Volume with non-reporters in location
 + Volume with non-reporters outside location
 + Volume with reporters outside location

Local turnover =	(1/2) Inter-location reporter-to-reporter volume	Inter-location non-reporter volume	Extra-location volume (reporter+non-reporter)
Location X = 900	300	100	500
Location Y = 700	200	100	400

Global turnover net of cross-border double-counting

Aggregate turnover = Sum of local turnover estimates
 - (1/2)(Sum of cross-border reporter-to-reporter volume)

Global turnover net of cross-border double counting =	Sum of local turnover	-(1/2) Sum of cross-border reporter-to-reporter volume
1200	1600	- 400

(b) Market value of contracts outstanding

Estimation of the market value of contracts "booked" within a location requires that firms report contract market value information according to the location and reporter characteristics of each contract's counterparty. To maintain comparability with the notional amounts outstanding, the market value of contracts reported by firms should exclude all non-arms-length contracts with affiliates. For each product type, firms must calculate and report:

- (i) the gross positive market value of contracts with all other reporting firms regardless of counterparty location;
- (ii) the gross negative market value of contracts with other reporting firms in other survey locations;
- (iii) the gross positive market value of contracts with non-reporters regardless of location;
- (iv) the gross negative market value of contracts with non-reporters regardless of location.

The aggregate market value of contracts outstanding at a location is the sum across all reporting offices of the values reported in each product category:

Market value of contracts at a location =

- + sum across firms of the gross positive market value of contracts with all other reporters regardless of counterparty location
- + sum across reporters of the gross negative market value of contracts with other reporters in other survey locations
- + sum across firms of the gross positive market value of contracts with non-reporters regardless of location
- + sum across firms of the gross negative market value of contracts with non-reporters regardless of location.

The global estimate of the market value of contracts correcting for cross-location double-counting is given by:

- + sum of the aggregate market value by locations
- sum across regions of gross negative market value of contracts with other reporters in other regions.

ANNEX II

**Explanatory Notes and Survey Forms for the April 1995
Central Bank Survey of Foreign Exchange and Derivatives Market Activity**

Central Bank Survey of Foreign Exchange and Derivatives Market Activity

Explanatory Notes

In May 1994, the Governors of the Central Banks of the Group of Ten Countries agreed to a recommendation of the Euro-currency Standing Committee that they should sponsor an internationally coordinated survey among a broad group of intermediaries in derivatives markets. The primary objective of the Survey is to obtain reasonably comprehensive and internationally consistent data on the size and structure of derivatives markets. The Survey focuses on the *size* of derivatives markets and on the role of these markets in the transfer of price risk. This Survey is not intended to obtain information about the risk profile of individual market participants. Additionally, although credit risk is a concern of Central Banks, it is not the focus of this Survey.

The survey of derivatives markets will be combined with the existing triennial Central Bank Survey of Foreign Exchange Market Activity. The combined Survey will be held in March/April 1995. Even if banks and other reporters take part solely on a voluntary basis, previous experience suggests that the coverage of market intermediaries should be quite comprehensive. A combined survey will also provide an opportunity to obtain consistent market data with regard to foreign exchange and derivatives markets activity.

1. Coverage

Market risk categories: The survey will collect data on foreign exchange transactions and derivatives products according to the following broad market classification:

- foreign exchange transactions (Tables 1A to 1N)
- single-currency interest rate derivatives (Tables 2A to 2I)
- equity and stock index derivatives (Table 3A)
- commodity derivatives (including precious metals) (Table 4A).

The extent of information requested on each of these market classes reflects their relative importance for central banks and their policy responsibilities. A greater level of detail is therefore being requested in the foreign exchange and interest rate derivatives markets.

Instrument types. For derivatives the following instrument breakdown is envisaged:

- OTC forward contracts
- OTC swaps
- OTC options
- Other OTC products
- Exchange-traded futures
- Exchange-traded options.

Types of data requested. To gauge the size of the foreign exchange and derivatives markets, the survey will collect the following information:

- (i) Turnover in nominal or notional amounts (Tables 1A to 1I, 2A to 2C)
- (ii) Outstandings in nominal or notional amounts (Tables 1J to 1L, 2D to 2G, 3A, 4A) and in gross market values (Tables 1M to 1N, 2H to 2I, 3A, 4A).

(i) Turnover data

Turnover data provide a measure of market activity, and can also provide a rough proxy for market liquidity. Turnover is defined as the gross value of all new deals entered into (not settled) during the month, and is measured in terms of the nominal or notional amount for spot, forward, swap, and futures contracts, and in terms of nominal or notional amounts and premia for option contracts. The gross amount of each transaction is recorded once, and netting arrangements and offsets are ignored.

Turnover data are requested for foreign exchange spot transactions and for foreign exchange and interest rate derivatives only. It is proposed that, as in previous years, turnover data be collected over a one-month period. This will reduce the likelihood that very short term variations in activity might contaminate the data. Data collected for the Survey should reflect all transactions entered into during the calendar month of April 1995, regardless of whether delivery or settlement is made during that month.

For turnover data, the basis for reporting should be the location of the trade. The trade location principle should apply even if deals entered into in different locations are booked in a central location. In such cases, multiple reports (filed by different offices) may be necessary, although reporting institutions should ensure that individual transactions are reported only once.

For turnover of transactions with variable nominal or notional principal amounts, the basis for reporting should be the nominal or notional principal amounts on the transaction date.

(ii) Amounts outstanding

Market size in terms of amounts outstanding for OTC products is measured by nominal or notional amount and gross market value. Taken together these measures provide a more meaningful indication of market size than either measure in isolation.

Outstandings in nominal or notional amounts provide a rough measure of the potential transfer of price risk in derivative markets. They are also comparable to measures of market size in related underlying cash markets and shed useful light on the relative size and growth of cash and derivatives markets.

For transactions with *variable nominal or notional principal amounts*, the basis for reporting should be the nominal or notional principal amounts at the time of reporting.

Outstandings in terms of gross market value also provide information about the size of derivatives markets and the scale of gross transfer of price risks. Gross market value at current market prices also provides a measure of market size and economic significance that is readily comparable across derivative markets and products. The objective of the survey is to measure the aggregate replacement value of contracts entered into in various markets. Reporters will be requested to provide both gross positive and gross negative market values in order to permit calculation of this aggregate market value. The gross positive market value is the sum of the values of all those contracts that have positive market values. The gross negative market value is the sum of the values of all those contracts that have negative market values. Reporting of negative market values will allow the positive market value of contracts held by counterparties who are not participating in the survey to be captured on a vis-à-vis basis. The gross positive market value of a firm's outstanding contracts represents its claims at replacement cost on counterparties arising from derivatives activities. The gross negative market value is a measure of the firm's gross derivatives-related liabilities at replacement cost.

Data on amounts outstanding are requested for OTC contracts only. In case of foreign exchange swaps which are concluded as spot/forward transactions, only the unsettled forward part of the deal should be reported. If foreign exchange swaps are executed on a forward/forward basis, amounts outstanding should be reported separately for both legs. For other forward contracts and swaps, the transaction should always be reported as one transaction only. For option-type products, market values may be calculated using in-house pricing models.

For amounts outstanding (both notional and gross market values) the basis for reporting is book location, which may differ from trade location. In order to minimise inconsistencies between data on turnover and amounts outstanding, book location

reporting should be at the lowest level of aggregation possible (local branch/subsidiary level as opposed to a world-wide consolidated book). It is therefore recommended that amounts outstanding be compiled separately for each office of a reporting institution in a given country and that the data be reported to the central bank where the relevant office of a reporting dealer is located.

All data on amounts outstanding should be collected as of end-March 1995 since for many countries this coincides with the end of an accounting period.

Currency of reporting and currency conversion: In general, transactions are to be reported in US dollar equivalents. For amounts outstanding, non-dollar amounts should be converted into US dollars using the end-of-period exchange rates, while for turnover data the exchange rates prevailing on the transaction date should be applied. However, if this is impractical or impossible, turnover data may be reported using average or end-of-period rates. When exchange rates other than those of the day of transaction are used, the order of precedence of currencies' dollar exchange rates for the purpose of conversion in deals which involve currencies other than the US dollar should be the same as listed in the foreign exchange section of the survey forms (i.e. DEM, JPY, GBP, etc.). Reporting dealers who cannot provide data in terms of US dollars may alternatively report turnover data in the original currencies of transactions.

Transactions which involve the direct exchange of two currencies other than the US dollar should be measured by totalling the US dollar equivalent of only one side of the transaction. Cross-currency deals passing through a vehicle currency should be recorded as two separate transactions against the vehicle currency.

Rounding: All data entered on the report form should be rounded to the nearest million US dollars (do not use decimals). Rounding should occur only when reporting the monthly totals for each category.

2. Currency and other market risk breakdowns

Because the currency composition of foreign exchange dealings varies greatly between centres, the existing foreign exchange market survey leaves countries considerable scope for discretion in seeking information in individual centres. The same discretion applies to the currency breakdown of derivatives markets data. However, to obtain consistent data on turnover in the principal currency segments of the foreign exchange market, respondents in all locations should report turnover data on foreign exchange transactions, including all foreign exchange derivatives, with the same extended currency breakdown as in the existing triennial Central Bank Survey of Foreign Exchange Market Activity. For amounts outstanding in foreign exchange

derivatives, data may be reported with a more limited breakdown involving the three main currencies (USD, DEM, JPY) as follows:

- USD/DEM
- USD/JPY
- USD/Currencies other than DEM and JPY
- DEM/JPY
- DEM/Currencies other than USD and JPY
- JPY/Currencies other than USD and DEM
- Other currency-pairs.

For turnover and amounts outstanding of single-currency interest rate derivatives, the following disaggregation has been adopted:

- USD
- DEM
- JPY
- Other interest rates.

Only amounts outstanding data will be requested on equity and commodity derivatives. Derivatives involving equity and stock indices should be categorised according to whether they involve US, Japanese, European indices (excluding emerging markets in eastern Europe), or other equity and stock indices. For commodity products, only contracts involving gold are to be reported separately as an "of which" item.

3. Counterparties

Following the methodology of the existing triennial Central Bank Survey of Foreign Exchange Market Activity, reporters are requested to provide for all foreign exchange data and single-currency interest rate derivatives separate information on local and cross-border transactions. The distinction between local and cross-border should be determined according to the location of the counterparty and not its nationality. Counterparty data will be classified by "other dealers", "other financial institutions" and "non-financial customers".

"Other dealers" are in principle defined as those either in the same country, or in another country, *who participate in the co-ordinated survey*; they will mainly be commercial and investment banks and securities houses, who play a role as market-makers or intermediaries, and other entities who are active dealers (e.g. subsidiaries of insurance companies). These transactions will provide information on "interdealer trades".

"Other financial institutions" covers all categories of financial institutions not participating in the survey, including banks, funds and non-bank financial institutions which may be considered as financial end-users (e.g. mutual funds, UCITS, pension funds, hedge funds, currency funds, money market funds, building societies, leasing companies, insurance companies, central banks).

A non-financial "customer" will be any other counterparty, in practice mainly corporate firms and governments.

Elimination of double-counting: Double-counting arises because transactions between two reporting entities will be recorded by each of them, i.e. twice. In order to derive measures of overall market size, it is necessary to make adjustments for local inter-dealer double-counting and, in the globally aggregated data, for cross-border double-counting as well. To adjust the data for double-counting, reporters are being asked to distinguish transactions contracted with other reporters (dealers).

In order to allow for the accurate elimination of (local and cross-border) double-counting of inter-reporter transactions, reporting institutions should identify transactions with other survey participants to the best of their ability. In addition, central banks may provide lists of reporting institutions in order to facilitate the identification of survey participants. All transactions contracted with other reporting institutions should be included in the "other dealers" categories. National data may be adjusted for local double counting by the national central banks, but the elimination of cross-border double counting can only be done meaningfully for the global figures, which will be calculated by the BIS.

Gaps in reporting will stem from two sources: incomplete reporting (i.e. deals between two non-reporters) in the countries providing data, and less than full coverage of the range of countries in which the surveyed activity takes place. The second type of gap is likely to be mitigated to the extent that the firms in countries in which no survey is being conducted are counterparties of firms participating in the survey.

Arms-length transactions: Market participants are asked to include in their reporting the aggregate gross value of all arms-length market transactions concluded by their offices. An "arms-length" transaction is defined as one where the dealer is indifferent as to the counterparty. In other words, in-house deals and deals with other offices of the same institution should be included if the trader would have been equally willing to conclude the deal in question with a fully independent market participant.

4. Maturities

For nominal or notional principal amounts outstanding a breakdown is requested by remaining maturity. The maturity bands are as follows:

- up to one year
- over one year and up to five years
- over five years.

In addition, turnover data on outright forwards and foreign exchange swaps should be reported according to the maturity bands used in the existing triennial Central Bank Survey of Foreign Exchange Market Activity as follows:

- up to seven days
- over seven days and up to one year
- over one year.

In the case of transactions where the first leg has not come due, the remaining maturity is determined by the difference between the near and far-end dates of the transaction and not by the date of conclusion of the deal.

5. Categorisation of derivatives involving more than one market risk category

Individual derivatives transactions are to be categorised into four market classes: foreign exchange, single-currency interest rate, equity, and commodity. In practice, however, individual derivatives transactions may involve more than one market category. In such cases, transactions that are simple combinations of exposures should be reported separately in terms of their components as discussed in section 6 below. Transactions that cannot be readily decomposed into separable market risk components should be reported in only one market risk category. The allocation of such products with multiple exposures should be determined by the underlying risk component which is most significant. However, if, for practical reasons, reporting institutions are in doubt about the correct classification of multi-exposure derivatives, they should allocate the deals to the four market risk categories according to the following order of precedence:

Commodities. All derivative transactions involving a commodities or commodity index exposure, whether they involve a joint exposure in commodities or any other market risk category (i.e. foreign exchange, interest rate or equity) should be reported in this category.

Equities. With the exception of contracts with a joint exposure to commodities and equity, which are to be reported as commodities, all derivatives transactions with a link to the performance of equities or equity indices should be reported here. That is,

equity deals with exposure to foreign exchange or interest rates should be included in this category. Quanto-type instruments are an example of deals with joint equity and foreign currency exposures, and would be reported in this category.

Foreign exchange. This category will include all derivatives transactions (with the exception of those already reported in the commodity and equity categories) with exposure to more than one currency, be it in interest or exchange rates.

Single-currency interest rate contracts. This category will include derivatives transactions in which there is exposure to one and only one currency's interest rate. This category should include all fixed and/or floating single-currency interest rate contracts including forwards, swaps and options.

6. Instrument definitions and instructions for the categorisation of derivatives transactions

As noted in Section 1 above, within each market risk category OTC derivatives transactions will be broken down by three types of plain vanilla instruments (forwards, swaps, and options). Plain vanilla instruments are traded in generally liquid markets according to more or less standardised contracts and market conventions. If a transaction is composed of several "plain-vanilla" components, each part should in principle be reported separately.

In addition, there will be a separate category for other products. This category will mainly include transactions with a variable notional principal amount or contract features which act to multiply leverage. In addition, deals where a decomposition into individual "plain-vanilla" components is impractical or impossible may also be classified as other products. For example, "index-amortising rate swaps" and "leveraged swaps", such as LIBOR squared, are "other products" in the single-currency interest rate market category, and "differential swaps" (diff swaps) are "other products" in the foreign exchange category.

Exchange-traded instruments will be broken down into futures and options. Futures will be further split into money market and capital market interest rate futures (i.e. futures on interest rates up to one year and futures on interest rates over one year).

Typical OTC transactions should be defined and categorised as follows:

Foreign exchange

Plain Vanilla Instruments

Outright forward: Currency trade to be settled at some time in the future (more than two business days).

- Foreign exchange swap:* Simultaneous purchase and sale of a certain amount of foreign currency for two different value dates without periodic exchange of interest payments. "Tomorrow/next day" transactions should also be included in this category.
- Currency swap:* Contract which commits two counterparties to exchange streams of fixed interest payments in different currencies for an agreed period of time and to exchange principal amounts in different currencies at an agreed exchange rate at the end of the period.
- Cross-currency swap:* Variation of currency-swap in which at least one of the payments streams varies with a floating interest rate. These instruments fall into the currency swaps section.
- Currency option:* Option contract that gives the right to buy or sell a currency with another currency at a specified exchange rate during a specified period. This category should include exotic foreign exchange options such as average rate options and barrier options. These instruments fall into the OTC options section.

Other foreign exchange derivative products

This category should mainly comprise OTC foreign exchange derivative instruments which involve several features and where a decomposition into individual "plain-vanilla" components is impractical or impossible, such as swaps with underlying notional principal in one currency and fixed or floating interest rate payments based on interest rates in currencies other than the notional (differential swaps or diff swaps).

Single-currency interest rate derivatives

Plain Vanilla Instruments

- Forward rate agreement (FRA):* Interest rate forward contract 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.
- Interest rate swap:* Agreement to exchange periodic payments related to interest rates on a single currency; could be fixed for floating, or floating for floating based on different indices. This group includes those swaps whose notional principal is amortised according to a fixed schedule independent of interest rates.

The options category within plain vanilla single-currency interest rate derivatives is divided into two sections. The first section, options on traded securities, should include options on interest-bearing underlying instruments, such as options on government security futures. The second category, other options, should include interest-rate options and specialised options, such as caps, floors, collars and swaptions.

- Option on traded securities:* OTC option on an interest bearing underlying security. These products fall into the OTC options on traded securities sub-section.
- Interest rate option:* OTC option, provision to pay or receive a specific interest rate on a predetermined principal for a set period of time. These products fall into the other OTC options sub-section.
- Interest rate cap:* OTC option that pays the difference between a floating interest rate and the cap rate. These products fall into the other OTC options sub-section.
- Interest rate floor:* OTC option that pays the difference between the floor rate and the floating interest rate. These products fall into the other OTC options sub-section.
- Interest rate collar:* Combination of cap and floor. These products fall into the other OTC options sub-section.
- Interest rate swaption:* OTC option to enter into an interest rate swap contract, purchasing the right to pay or receive a certain fixed rate. These products fall into the other OTC options sub-section.
- Interest rate warrants:* OTC option; long-dated (over one year) interest rate option. These products fall into the other OTC options sub-section.

Other interest rate derivative products

This category should mainly comprise OTC interest rate derivative instruments with leveraged payoffs and/or those whose notional principal varies as a function of interest rates. For example, swaps based on LIBOR squared as well as index amortising rate swaps would fall into this category.

Equity derivatives

- Equity forward:* Contract to exchange an equity or equity basket at a set price at a future date. These products fall into the forwards and swaps section.
- Equity swap:* Contract in which one or both payments are linked to the performance of equities or an equity index (i.e., S&P 500). It may involve the exchange of one equity or equity index return for another, or the exchange of an equity or equity index return for a floating or fixed interest rate. These products fall into the forwards and swaps section.
- Equity option:* OTC option, provision to deliver or receive a specific equity or equity basket at an agreed price at an agreed time in the future. May be single-stock or equity-index option. These products fall into the OTC options section.

The equity category does not have an "other" derivative product section; other equity derivative products should therefore be reported in either the OTC options or the forwards and swaps sections. The OTC option section should assume precedence in instrument classifications, so that any equity derivative product with an embedded option will be reported as an OTC option. All other OTC equity derivative products should be reported in the forwards and swaps section.

Commodity derivatives

Commodity forward: Forward contract to exchange a commodity or commodity index at a set price at a future date. These instruments fall into the forwards and swaps section.

Commodity swap: Contract with one or both payments linked to the performance of a commodity price or a commodity index. It may involve the exchange of the return on a commodity or commodity index for another, or the exchange of a commodity index for a floating or fixed interest rate. These instruments fall into the forwards and swaps section.

Commodity option: OTC option to deliver or receive a specific commodity or commodity index at an agreed price at a set date in the future. These instruments fall into the OTC options section.

The commodities category does not have an "other" derivative product section; other commodity derivative products will be reported in either the OTC options or the forwards and swaps section. The OTC option section will assume precedence in instrument classification, so that any commodity derivative product with an embedded option will be reported as an OTC option. All other OTC commodity derivative products should be reported in the swaps and forwards section.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	Domestic currency against											Total
	USD	DEM	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	
SPOT²												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
OUTRIGHT FORWARDS												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
Maturities												
up to seven days												
over seven days and up to one year												
over one year												
FOREIGN EXCHANGE SWAPS³												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
Maturities												
up to seven days												
over seven days and up to one year												
over one year												

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² Excluding "tomorrow/next day" transactions. ³ A swap is considered to be a single transaction in that the two legs are not counted separately. Including "tomorrow/next day" transactions.

Table 1B

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	USD against										
	DEM	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total
SPOT²											
with other dealers											
- local											
- cross-border											
with other financial institutions											
- local											
- cross-border											
with non-financial customers											
- local											
- cross-border											
TOTAL											
OUTRIGHT FORWARDS											
with other dealers											
- local											
- cross-border											
with other financial institutions											
- local											
- cross-border											
with non-financial customers											
- local											
- cross-border											
TOTAL											
Maturities											
up to seven days											
over seven days and up to one year											
over one year											
FOREIGN EXCHANGE SWAPS³											
with other dealers											
- local											
- cross-border											
with other financial institutions											
- local											
- cross-border											
with non-financial customers											
- local											
- cross-border											
TOTAL											
Maturities											
up to seven days											
over seven days and up to one year											
over one year											

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² Excluding "tomorrow/next day" transactions. ³ A swap is considered to be a single transaction in that the two legs are not counted separately. Including "tomorrow/next day" transactions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	DEM against										Residual	Total	
	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total			
SPOT²													
with other dealers													
- local													
- cross-border													
with other financial institutions													
- local													
- cross-border													
with non-financial customers													
- local													
- cross-border													
TOTAL													
OUTRIGHT FORWARDS													
with other dealers													
- local													
- cross-border													
with other financial institutions													
- local													
- cross-border													
with non-financial customers													
- local													
- cross-border													
TOTAL													
Maturities													
up to seven days													
over seven days and up to one year													
over one year													
FOREIGN EXCHANGE SWAPS³													
with other dealers													
- local													
- cross-border													
with other financial institutions													
- local													
- cross-border													
with non-financial customers													
- local													
- cross-border													
TOTAL													
Maturities													
up to seven days													
over seven days and up to one year													
over one year													

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² Excluding "tomorrow/next day" transactions. ³ A swap is considered to be a single transaction in that the two legs are not counted separately. Including "tomorrow/next day" transactions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	Domestic currency against											
	USD	DEM	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total
CURRENCY SWAPS²												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
OTC OPTIONS³												
Sold (notional)												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
Bought (notional)												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
TOTAL OTC OPTIONS												
Premia collected												
Premia paid												

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² A swap is considered to be a single transaction in that the two legs are not counted separately. ³ Including currency warrants and multi-currency swaptions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	USD against											
	DEM	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total	
CURRENCY SWAPS²												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
OTC OPTIONS³												
<u>Sold (notional)</u>												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
<u>Bought (notional)</u>												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
TOTAL OTC OPTIONS												
<u>Premia collected</u>												
<u>Premia paid</u>												

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² A swap is considered to be a single transaction in that the two legs are not counted separately. ³ Including currency warrants and multi-currency swaptions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	DEM against										Residual	Total
	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total		
<u>CURRENCY SWAPS²</u>												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
<u>OTC OPTIONS³</u>												
<u>Sold (notional)</u>												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
<u>Bought (notional)</u>												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
TOTAL OTC OPTIONS												
<u>Premia collected</u>												
<u>Premia paid</u>												

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² A swap is considered to be a single transaction in that the two legs are not counted separately. ³ Including currency warrants and multi-currency swaptions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	Domestic currency against											Total
	USD	DEM	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	
OTHER PRODUCTS²												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
FUTURES												
Sold												
Bought												
TOTAL												
EXCHANGE-TRADED OPTIONS												
Sold (notional)												
Bought (notional)												
TOTAL												
Premia collected												
Premia paid												

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" components is impractical or impossible.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	USD against											
	DEM	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total	
OTHER PRODUCTS²												
with other dealers												
- local												
- cross-border												
with other financial institutions												
- local												
- cross-border												
with non-financial customers												
- local												
- cross-border												
TOTAL												
FUTURES												
Sold												
Bought												
TOTAL												
EXCHANGE-TRADED OPTIONS												
Sold (notional)												
Bought (notional)												
TOTAL												
Premia collected												
Premia paid												

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² Any instrument where the transaction is highly leveraged and/or the notional amount is variable and a decomposition into individual "plain-vanilla" components is impractical or impossible.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE TRANSACTIONS¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	DEM against										Residual	Total	
	JPY	GBP	CHF	FRF	CAD	AUD	XEU	Other EMS currencies	Other	Total			
OTHER PRODUCTS²													
with other dealers													
- local													
- cross-border													
with other financial institutions													
- local													
- cross-border													
with non-financial customers													
- local													
- cross-border													
TOTAL													
FUTURES													
Sold													
Bought													
TOTAL													
EXCHANGE-TRADED OPTIONS													
Sold (notional)													
Bought (notional)													
TOTAL													
Premia collected													
Premia paid													

¹ All transactions involving exposure to more than one currency, be it in interest or exchange rates. ² Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" instruments is impractical or impossible.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD / DEM	USD / JPY	USD / Currencies other than DEM and JPY	DEM / JPY	DEM / Currencies other than USD and JPY	JPY / Currencies other than USD and DEM	All other pairs of currencies	TOTAL
<u>OUTRIGHT FORWARDS AND FOREIGN EXCHANGE SWAPS²</u>								
with other dealers								
- local								
- cross-border								
with other financial institutions								
- local								
- cross-border								
with non-financial customers								
- local								
- cross-border								
TOTAL								
<i>Maturities</i>								
up to one year								
over one year and up to five years								
over five years								
<u>CURRENCY SWAPS</u>								
with other dealers								
- local								
- cross-border								
with other financial institutions								
- local								
- cross-border								
with non-financial customers								
- local								
- cross-border								
TOTAL								
<i>Maturities</i>								
up to one year								
over one year and up to five years								
over five years								

¹ All instruments involving exposure to more than one currency, be it in interest or exchange rates. ² If swaps are executed on a forward/forward basis, both forward parts of the transaction should be reported separately.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD / DEM	USD / JPY	USD / Currencies other than DEM and JPY	DEM / JPY	DEM / Currencies other than USD and JPY	JPY / Currencies other than USD and DEM	All other pairs of currencies	TOTAL
OTC OPTIONS²								
Sold								
with other dealers								
- local								
- cross-border								
with other financial institutions								
- local								
- cross-border								
with non-financial customers								
- local								
- cross-border								
TOTAL								
Maturities								
up to one year								
over one year and up to five years								
over five years								
Bought								
with other dealers								
- local								
- cross-border								
with other financial institutions								
- local								
- cross-border								
with non-financial customers								
- local								
- cross-border								
TOTAL								
Maturities								
up to one year								
over one year and up to five years								
over five years								
TOTAL OTC OPTIONS								

¹ All instruments involving exposure to more than one currency, be it in interest or exchange rates. ² Including currency warrants and multi-currency swaptions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD / DEM	USD / JPY	USD / Currencies other than DEM and JPY	DEM / JPY	DEM / Currencies other than USD and JPY	JPY / Currencies other than USD and DEM	All other pairs of currencies	TOTAL
<u>OTHER PRODUCTS²</u>								
with other dealers								
- local								
- cross-border								
with other financial institutions								
- local								
- cross-border								
with non-financial customers								
- local								
- cross-border								
TOTAL								
<i>Maturities</i>								
up to one year								
over one year and up to five years								
over five years								
<u>FUTURES</u>								
<u>Sold</u>								
<u>Bought</u>								
TOTAL								
<u>EXCHANGE-TRADED OPTIONS</u>								
<u>Sold</u>								
<u>Bought</u>								
TOTAL								

¹ All instruments involving exposure to more than one currency, be it in interest or exchange rates. ² Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" components is impractical or impossible.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE RATE DERIVATIVES¹
Gross market values at end-March 1995

(in millions of USD)

Instruments	Gross positive market value of contracts	Gross negative market value of contracts
<p><u>OUTRIGHT FORWARDS AND FOREIGN EXCHANGE SWAPS²</u></p> <p>with other dealers</p> <ul style="list-style-type: none"> - local - cross-border <p>with other financial institutions</p> <ul style="list-style-type: none"> - local - cross-border <p>with non-financial customers</p> <ul style="list-style-type: none"> - local - cross-border <p>TOTAL</p> <p><u>CURRENCY SWAPS</u></p> <p>with other dealers</p> <ul style="list-style-type: none"> - local - cross-border <p>with other financial institutions</p> <ul style="list-style-type: none"> - local - cross-border <p>with non-financial customers</p> <ul style="list-style-type: none"> - local - cross-border <p>TOTAL</p>		

¹ All instruments involving exposure to more than one currency, be it in interest or exchange rates. ² If swaps are executed on a forward/forward basis, both forward parts of the transaction should be reported separately.

Table 1N

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

FOREIGN EXCHANGE RATE DERIVATIVES¹
Gross market values at end-March 1995

(in millions of USD)

Instruments	Gross positive market value of contracts	Gross negative market value of contracts
<u>OTC OPTIONS²</u>		
<u>Sold</u>		
with other dealers		
- local		
- cross-border		
with other financial institutions		
- local		
- cross-border		
with non-financial customers		
- local		
- cross-border		
TOTAL		
<u>Bought</u>		
with other dealers		
- local		
- cross-border		
with other financial institutions		
- local		
- cross-border		
with non-financial customers		
- local		
- cross-border		
TOTAL		
<u>OTHER PRODUCTS³</u>		
with other dealers		
- local		
- cross-border		
with other financial institutions		
- local		
- cross-border		
with non-financial customers		
- local		
- cross-border		
TOTAL		

¹ All instruments involving exposure to more than one currency, be it in interest or exchange rates. ² Including currency warrants and multi-currency swaptions. ³ Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" components is impractical or impossible.

Table 2A

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
<u>FORWARD RATE AGREEMENTS</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<u>SWAPS²</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<u>OTC OPTIONS</u>					
- <u>On traded securities</u>					
<u>Sold (notional)</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					

¹ All transactions where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts. ² A swap is considered to be a single transaction in that the two legs are not counted separately.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
<u>OTC OPTIONS</u>					
- On traded securities					
<u>Bought (notional)</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
TOTAL OPTIONS ON TRADED SECURITIES					
<u>Premia collected</u>					
<u>Premia paid</u>					
- Other options ²					
<u>Sold (notional)</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<u>Bought (notional)</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
TOTAL OTHER OPTIONS					
<u>Premia collected</u>					
<u>Premia paid</u>					
TOTAL OTC OPTIONS					
TOTAL PREMIA COLLECTED					
TOTAL PREMIA PAID					

¹ All transactions where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts. ² Including caps, floors, collars, warrants and swaptions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Turnover in nominal or notional principal amounts during April 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
<u>OTHER PRODUCTS²</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<u>FUTURES</u>					
- <u>on interest rates up to one year</u>					
<u>Sold</u>					
<u>Bought</u>					
TOTAL					
- <u>on interest rates over one year</u>					
<u>Sold</u>					
<u>Bought</u>					
TOTAL					
TOTAL FUTURES					
<u>EXCHANGE-TRADED OPTIONS</u>					
<u>Sold</u> (notional)					
<u>Bought</u> (notional)					
TOTAL					
<u>Premia collected</u>					
<u>Premia paid</u>					

¹ All transactions where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts. ² Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" components is impractical or impossible.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
<u>FORWARD RATE AGREEMENTS</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<i>Maturities</i>					
up to one year					
over one year and up to five years					
over five years					
<u>SWAPS</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<i>Maturities</i>					
up to one year					
over one year and up to five years					
over five years					

¹ All instruments where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
OTC OPTIONS					
- <u>On traded securities</u>					
Sold					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
Maturities					
up to one year					
over one year and up to five years					
over five years					
Bought					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
Maturities					
up to one year					
over one year and up to five years					
over five years					
TOTAL OPTIONS ON TRADED SECURITIES					

¹ All instruments where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
<u>OTC OPTIONS</u>					
- <u>Other options</u> ²					
<u>Sold</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<u>Maturities</u>					
up to one year					
over one year and up to five years					
over five years					
<u>Bought</u>					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<u>Maturities</u>					
up to one year					
over one year and up to five years					
over five years					
TOTAL OTHER OPTIONS					
TOTAL OTC OPTIONS					

¹ All instruments where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts. ² Including caps, collars, warrants and swaptions.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Nominal or notional principal amounts outstanding at end-March 1995

(in millions of USD)

Instruments	USD	DEM	JPY	Other interest rates	TOTAL
OTHER PRODUCTS²					
with other dealers					
- local					
- cross-border					
with other financial institutions					
- local					
- cross-border					
with non-financial customers					
- local					
- cross-border					
TOTAL					
<i>Maturities</i>					
up to one year					
over one year and up to five years					
over five years					
FUTURES					
- on interest rates up to one year					
<u>Sold</u>					
<u>Bought</u>					
TOTAL					
- on interest rates over one year					
<u>Sold</u>					
<u>Bought</u>					
TOTAL					
TOTAL FUTURES					
EXCHANGE-TRADED OPTIONS					
<u>Sold</u>					
<u>Bought</u>					
TOTAL					

¹ All instruments where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts. ² Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" components is impractical or impossible.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Gross market values at end-March 1995

(in millions of USD)

Instruments	Gross positive market value of contracts					Gross negative market value of contracts				
	USD	DEM	JPY	Other interest rates	Total	USD	DEM	JPY	Other interest rates	Total
FORWARD RATE AGREEMENTS										
with other dealers										
- local										
- cross-border										
with other financial institutions										
- local										
- cross-border										
with non-financial customers										
- local										
- cross-border										
TOTAL										
SWAPS										
with other dealers										
- local										
- cross-border										
with other financial institutions										
- local										
- cross-border										
with non-financial customers										
- local										
- cross-border										
TOTAL										

¹ All instruments where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

SINGLE-CURRENCY INTEREST RATE DERIVATIVES¹
Gross market values at end-March 1995

(in millions of USD)

Instruments	Gross positive market value of contracts					Gross negative market value of contracts				
	USD	DEM	JPY	Other interest rates	Total	USD	DEM	JPY	Other interest rates	Total
OTC OPTIONS										
- <u>On traded securities</u>										
with other dealers										
- local										
- cross-border										
with other financial institutions										
- local										
- cross-border										
with non-financial customers										
- local										
- cross-border										
TOTAL										
- <u>Other options²</u>										
with other dealers										
- local										
- cross-border										
with other financial institutions										
- local										
- cross-border										
with non-financial customers										
- local										
- cross-border										
TOTAL										
TOTAL OTC OPTIONS										
OTHER PRODUCTS³										
with other dealers										
- local										
- cross-border										
with other financial institutions										
- local										
- cross-border										
with non-financial customers										
- local										
- cross-border										
TOTAL										

¹ All instruments where all the legs are exposed to one and only one currency's interest rate, including all fixed/floating and floating/floating single-currency interest rate contracts. ² Including caps, floors, collars, warrants and swaptions. ³ Any instrument where the transaction is highly leveraged and/or the notional amount is variable and where a decomposition into individual "plain-vanilla" components is impractical or impossible.

Table 3A

Spring 1995 Central Bank Survey Foreign Exchange
and Derivatives Market Activity

EQUITY AND STOCK INDEX DERIVATIVES¹
Amounts outstanding at end-March 1995

(in millions of USD)

Instruments	Nominal or notional value of contracts					Gross positive market value of contracts	Gross negative market value of contracts
	US equity and stock indices	Japanese equity and stock indices	European equity and stock indices ²	Other equity and stock indices	TOTAL		
FORWARDS AND SWAPS							
with other dealers							
with others							
TOTAL							
<i>Maturities</i>							
up to one year							
over one year and up to five years							
over five years							
OTC OPTIONS³							
Sold							
with other dealers							
with others							
TOTAL							
<i>Maturities</i>							
up to one year							
over one year and up to five years							
over five years							
Bought							
with other dealers							
with others							
TOTAL							
<i>Maturities</i>							
up to one year							
over one year and up to five years							
over five years							
TOTAL OTC OPTIONS							
FUTURES							
Sold							
Bought							
TOTAL							
EXCHANGE-TRADED OPTIONS							
Sold							
Bought							
TOTAL							

¹ Any instrument whose price is assumed to be mainly determined by the price of an equity or a stock index. ² Excluding emerging markets in eastern Europe. ³ Including warrants.

Spring 1995 Central Bank Survey of Foreign Exchange
and Derivatives Market Activity

COMMODITY DERIVATIVES¹
Amounts outstanding at end-March 1995

(in millions of USD)

Instruments	Nominal or notional value of contracts	Gross positive market value of contracts	Gross negative market value of contracts
<u>FORWARDS AND SWAPS</u>			
with other dealers			
with others			
TOTAL			
of which: gold			
<i>Maturities</i>			
up to one year			
over one year and up to five years			
over five years			
<u>OTC OPTIONS</u>			
<u>Sold</u>			
with other dealers			
with others			
TOTAL			
of which: gold			
<i>Maturities</i>			
up to one year			
over one year and up to five years			
over five years			
<u>Bought</u>			
with other dealers			
with others			
TOTAL			
of which: gold			
<i>Maturities</i>			
up to one year			
over one year and up to five years			
over five years			
TOTAL OTC OPTIONS			
<u>FUTURES</u>			
<u>Sold</u>			
of which: gold			
<u>Bought</u>			
of which: gold			
TOTAL			
<u>EXCHANGE-TRADED OPTIONS</u>			
<u>Sold</u>			
of which: gold			
<u>Bought</u>			
of which: gold			
TOTAL			

¹ Any instrument whose price is assumed to be mainly determined by the price of a commodity, including gold, metals and oil.

ANNEX III

Existing Data on Derivatives Market Activity

Existing Data On Derivatives Market Activity

(a) Sources of information on derivatives markets

(i) *Derivatives exchanges*

Derivatives exchanges publish detailed monthly notional data on turnover and open interest for listed contracts. Information on daily prices and volatilities is often available for a specific fee. Apart from special analyses that are occasionally published, derivatives exchanges do not release information on the structure of participation in exchange-traded markets.

(ii) *ISDA surveys*

The International Swaps and Derivatives Associations (ISDA) conducts surveys of global derivatives activity. The Working Group considered carefully these sources of information.

The ISDA surveys have made a significant contribution to the enhancement of public information on derivatives activities. Among their positive features is the greater disaggregation than central banks are requesting.

However, the Working Group noted that the surveys are not designed to meet fully the requirements of central banks for information on derivatives activities in several respects, notably: the surveys publish information on segments of the OTC derivatives activities (i.e. swaps and swaps-related transactions) and thus omit forwards/FRAs and many options transactions, as well as exchange-traded contracts; the reporting population of the surveys is confined to ISDA's membership and it can vary, although the Association seeks to ensure that the published statistics include the major dealers; ISDA publishes notional amounts, but not market values on a regular basis, of outstanding contracts; although data have been published with a significant lag, the Working Group has been advised that improvements in survey design will include greater timeliness; and the data underlying the surveys are not available to central banks for further analysis.

(iii) *Central banks and other authorities*

Some information on banks' exchange-traded and OTC activity is collected by central banks for supervisory purposes, although the type of information varies widely from country to country. Section (b) below reviews the data currently collected by

central banks on their banks' derivatives activity. With the exception of the foreign exchange market (where worldwide turnover of forwards and options is collected triennially through the Central Bank Survey of Foreign Exchange Market Activity), central banks have not attempted to construct global market size data for derivatives. The BIS compiles data on worldwide exchange-traded contracts and the swaps market from other sources (see section (c) below).

(b) Data currently collected by central banks

Most central banks gather some data on activity in derivatives markets. However, reporting systems are generally limited to banking entities and the information is used primarily for supervisory and capital adequacy purposes, although in the case of some countries the information is also used for statistical purposes. The periodicity of reporting varies from monthly to annual.

Prudential reporting by banks is conducted on a consolidated basis in a majority of countries. While six countries conduct reporting on both an unconsolidated and a consolidated basis, only Germany appears to be conducting purely unconsolidated reporting (excluding foreign subsidiaries, but including foreign branches of German banks). In a number of cases, the data are collected by independent supervisory authorities which pass the data to their central banks.

Banking supervisors' existing capital requirements relate largely to credit risk. As a result, data on exchange-traded instruments are generally not collected (that is, initial margins are classified as loans to exchanges, while payment of variation margin is deemed to eliminate further credit risk), and data related to derivatives tend to focus on credit risk associated with the outstanding stock of OTC contracts. In the latter regard, the internationally agreed methodology for calculating potential credit exposure means that the notional amounts of broad groupings of interest rate and exchange rate contracts are available, but that replacement cost/mark-to-market values are only available where banks have opted for the more sophisticated of the two measurement techniques available to them (i.e. the current as against the original exposure method). It appears that only four countries always require reporting on a mark-to-market basis (Canada, France, Sweden and the United States), although others (e.g. the UK) expect it of banks with substantial derivatives books.

As a result of the above considerations, few central banks currently collect data by instrument type. In cases where an instrument breakdown is requested, only the total value for a particular class of instrument is reported. For instance, FRAs and interest rate swaps might be reported as an aggregate but not broken down into interest rate,

currency or maturity sub-groups. The most detailed information is collected for foreign exchange derivatives. Most countries collect information on foreign exchange forwards and options. Coverage of traditional foreign exchange market swaps and currency swaps is more limited. The least detailed information concerns commodity and equity related contracts. At present, these are treated in the same manner as foreign exchange contracts for credit risk purposes and, as a result, are often aggregated with foreign exchange contracts in reporting forms.

Finally, banking supervisors require only limited information on counterparty type (in line with the existing Basle Accord which sets out counterparty risk weights). As a result, only a minority of countries request a breakdown of interest rate and exchange rates contract into local versus foreign counterparties.

(c) Data currently collected by the BIS

The BIS compiles once a year a survey of world derivatives market activity on the basis of data supplied by industry associations. Data on activity in exchange-traded markets worldwide are gathered from the Futures Industry Association (FIA) and from a number of separate derivatives exchanges. The source of data on OTC swaps and swap-related activity is ISDA.

The BIS also compiles and publishes the global results of the locational Central Bank Survey of Foreign Exchange Market Activity every three years. These surveys have in the past provided data on turnover of some foreign exchange derivatives products (both OTC and exchange-traded) during a one month period (the most recent survey was carried out in April 1992). A detailed breakdown by currency and some breakdown of counterparties is available. Stocks outstanding data have not been collected in past surveys but will be collected in the April 1995 Survey (see Annex II).

(d) Conclusion

Although some data on derivatives markets are available from a variety of sources, these remain inadequate for a proper assessment of market activity. While fairly detailed information on exchange-traded contracts is available from exchanges and trade associations, information that would help in assessing the role of these markets in price risk transfers (such as the make-up of end-users) or macroprudential concerns (such as concentration of activity or the relative share accounted for by various groups of market participants) is not available.

Information on OTC derivatives markets is rather limited. The surveys of activity in these markets conducted by ISDA (for swaps and swap-related derivatives) and the central banks (for FX-related derivatives) cover only subsets of overall OTC market activity and have hitherto focused on notional amounts.

The data collected by individual central banks on their banks' derivatives activity vary greatly in detail. The lack of a consistent reporting framework in terms of reporting basis (consolidated versus unconsolidated), definitions, products covered and periodicity, as well as the limited coverage of market segments, precludes consistent aggregation of the data for purposes of assessing global derivatives market activity.

Table I

Features of current derivatives business reporting to central banks

Country	Entities covered ¹	Nature of data Supervisory reporting or for statistical purposes	Consolidation basis	Valuation (notional value, market value, delta for options)	Stocks or flows	Periodicity of reporting	Products covered ²		Breakdowns				
							OTC	Ex-Tr.	Domestic/ Foreign currency	Counterparty breakdown			
										Resident/ Non- resident	Bank/ Non-bank	Risk weights under Capital Accord	
United States	US commercial banks	Super./Stat.	Consolidated	Notional value (market value for some items)	Stocks	Quarterly	Yes	Yes	No	No	No	No	No
Japan	Japanese commercial banks	Super.	Consolidated	Notional value	Stocks	Semi-annual/annual	Yes	Yes	Yes	No	No	No	No
Germany	Banks in Germany (including subsidiaries of non-EC banks and foreign branches of German banks)	Super./Stat.	Unconsolidated (consolidated)	Notional and delta values	Stocks	Monthly	Yes	Yes	Only IR and FX contracts	No	Yes	Yes	Yes
France	Credit institutions	Super./Stat.	Unconsolidated (consolidated for prudential reporting)	Notional value/market value	Stocks	Monthly for large institutions/quarterly for others	Yes	Yes	Yes	Yes	Only some FX contracts	Yes	Yes
Italy	Banks in Italy (including subsidiaries of non-EC banks and foreign branches of Italian banks)	Super.	Unconsolidated (consolidated)	Notional value	Stocks	Monthly (semi-annual)	Yes	Yes	Yes	Yes	No	No	No

Table I

Features of current derivatives business reporting to central banks (continued)

Country	Entities covered ¹	Nature of data supervisory reporting or for statistical purposes	Consolidation basis	Valuation (notional value, market value, delta for options)	Stocks or flows	Periodicity of reporting	Products covered ²		Breakdowns			
							OTC	Ex-Tr.	Domestic/ Foreign currency	Counterparty breakdown		
										Resident/ Non- resident	Bank/ Non-bank	Risk weights under Capital Accord
United Kingdom	Banks incorporated in the UK and branches of foreign banks	Super.	Unconsolidated (consolidated)	Notional value; market and delta values from most large derivatives users	Stocks	Quarterly (semi-annual)	Yes	No	No	No	No	Yes
Canada	Banks chartered in Canada	Super.	Consolidated	Notional and market value for IR and FX contracts	Stocks	Quarterly	Yes	No	No	No	No	Yes
Netherlands	Banks in the Netherlands (including EC and foreign branches of Dutch banks) and non-EC subsidiaries	Super.	Consolidated	Notional value for FX contracts, and delta values for options	Stocks	Monthly/ quarterly	Yes	No	Only FX contracts	No	No	No
Belgium	Banks in Belgium (including foreign branches of Belgian banks) and non-EC subsidiaries	Super./Stat.	Unconsolidated (consolidated)	Notional and delta values	Stocks	Monthly/ quarterly	Yes	Yes	Yes	Only FX contracts	No	No

Table 1

Features of current derivatives business reporting to central banks (continued)

Country	Entities covered ¹	Nature of data reporting or for statistical purposes	Consolidation basis	Valuation (notional value, market value, delta for options)	Stocks or flows	Periodicity of reporting	Products covered ²		Breakdowns			
							OTC	Ex-Tr.	Domestic/ Foreign currency	Counterparty breakdown		Risk weights under Capital Accord
										Resident/ Non-resident	Bank/ Non-bank	
Sweden	All banks and securities firms incorporated in Sweden	Super.	Consolidated	Notional and delta values	Stocks for some items/ flows for others	Monthly	Yes	Only IR and FX contracts	Only FX contracts	No	No	No
Switzerland	All financial institutions subject to Bank Act	Stat. for monetary policy purposes	Consolidated	Notional value	Stocks	Annual	Yes	Only FX contracts	Only FX contracts	Only FX contracts	No	No
Luxembourg	Banks in Luxembourg (including branches of EC and non-EC banks) and foreign branches/subsidiaries of Luxembourg banks	Super./Stat.	Consolidated (with branches/subsidiaries)	Notional value	Stocks	Monthly/ quarterly	Yes	Yes	Yes	Yes	Yes	Yes

¹ Under the Second Banking Directive all EU-based banks will have to report on a consolidated basis.

² No breakdown OTC/ exchange-traded instruments for US. Partial breakdown for Germany, Italy and Belgium. Exchange-traded instruments generally excluded from replacement cost data.

Table 2

Interest rate contracts

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Aggregate notional value - for all contracts (stocks)												
Detailed reporting of:												
Futures	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Forwards (FRAs)	Yes; but no split	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes
Swaps	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes
o/w Single currency	No	Yes	No	No	No	-	No	-	No	-	No	Yes
Cross currency	No	No	No	No	No	-	No	-	No	-	No	Yes
Swap related (floors, caps, collars)	No	No	No	No	Under opt.	No	No	No	No	No	No	No
Swaptions	No	No	No	No	No	No	No	No	No	No	No	No
Options (X-traded)	Yes; but no split	Yes	Yes; but no split	Yes	Yes; sales/purchases reported separately but no split	No	No	Yes!	Yes; sales/purchases reported but no split	No	No	Yes
o/w Purchased	No split		No split	No	X-traded/OTC	-	-	Yes	reported	-	-	No
Sold	X-traded/OTC		X-traded/OTC	Yes	X-traded/OTC	-	Yes	No	but no split	No	No	Yes
Options (OTC)	OTC		OTC	No	No	No	No	No	split	-	-	Yes
o/w Purchased				No	X-traded/OTC	-	Yes	No	X-traded/OTC	-	-	No
Sold				No	OTC	-	No	No		-	-	Yes
Aggregate replacement cost² - for all contracts gross+/gross-/net												
Detailed reporting of:												
Futures	Yes	No	No	Yes	No	No	Yes	Yes	No	No	No	No
Forwards (FRAs)	Gross +	CEM or OEM	CEM or OEM	Gross +/-	CEM or OEM	CEM or OEM	Gross +	-	-	Gross +	-	CEM or OEM
Swaps	No	No	No	No	No	No	No	No	No	No	No	No
Swap related (floors, caps, collars)	No	No	No	No	No	No	No	No	No	No	No	No
Swaptions	No	No	No	No	No	No	No	No	No	No	No	No
Options (X-traded)	No	No	No	No	No	No	No	Yes	No	Yes, but no split	No	No
o/w Purchased	-	-	-	No	-	-	-	Yes	-	X-traded/OTC	-	-
Sold	-	-	-	No	-	-	-	Yes	-	-	-	No
Options (OTC)	No	No	No	No	No	No	Yes	No	No	OTC	No	No
o/w Purchased	-	-	-	No	-	-	Yes	-	-	-	-	-
Sold	-	-	-	No	-	-	Yes	-	-	-	-	-

Table 2

Interest rate contracts (continued)

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Maturity												
Less/more than one year	Yes	Yes	Yes	Yes	No: less/more than 18 months	Yes	Yes	No	Yes	Yes	No	Yes
More detailed	No	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes
Currencies												
Domestic/other	No	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes
More detailed	No	No	Yes	No	No	No	No	No	Yes	No	No	Yes

1 Only for contracts on bonds traded on the European options exchange.

2 CEM refers to the Current Exposure Method (replacement/market value basis) for calculating credit exposures under the Basle Capital Accord; OEM refers to the Original Exposure Method whereby credit exposure is assessed as a percentage of notional amount outstanding.

Table 3

Foreign exchange contracts¹

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Aggregate notional value - for all contracts (stocks)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Detailed reporting of:												
Futures	Yes; but no split	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
Forwards	No	No	Yes	No	Yes	No	No	No	Yes	Yes	No	No
Treasury swaps	Yes	No	Yes ²	Yes	Yes	No	Yes	No	No	No	No	No
Currency swaps (principal exchange)	Yes	No	Yes ²	Yes	Yes	No	Yes	No	Yes	No	No	No
Options (X-traded)	Yes; but no split	Yes; only purchases and no split	Yes; but no split	Yes	Yes; but no split	Yes; but no split	No	Yes; but no split	Yes: sales/purchases reported but no split	No	No	Yes
o/w Purchased	X-traded/OTC	X-traded/OTC	X-traded/OTC	Yes	X-traded/OTC	X-traded/OTC	-	X-traded/OTC	split	-	-	No
Sold	OTC	OTC	OTC	Yes	OTC	OTC	Yes	OTC	X-traded/OTC	-	-	Yes
Options (OTC)												
o/w Purchased												
Sold												
Aggregate replacement cost³ - for all contracts gross+/gross-/net	Yes	No	No	Yes	No	No	Yes	Yes	No	No	No	No
Detailed reporting of:												
Futures	Gross +	OEM	CEM or OEM	Gross +/-	CEM or OEM	CEM or OEM	Gross +	-	CEM or OEM	Gross +	-	CEM or OEM
Forwards	No	No	No	No	No	No	No	No	No	No	No	No
Foreign exchange swaps	No	No	No	No	No	No	No	No	No	No	No	No
Currency swaps	No	No	No	No	No	No	Yes	No	No	No	No	No
Options (X-traded)	No	No	No	No	No	No	No	No	No	Yes, but no split	No	No
o/w Purchased	-	-	-	No	-	-	-	-	-	X-traded/OTC	-	-
Sold	No	No	No	No	No	No	Yes	No	No	OTC	No	No
Options (OTC)												
o/w Purchased	-	-	-	No	-	-	Yes	-	-	-	-	-
Sold	-	-	-	No	-	-	No	-	-	-	-	-

Table 3

Foreign exchange contracts (continued)

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Maturity												
Less/more than one year	Yes	No, break less/more than 14 days	Yes ⁴	Yes	No, less/more than 18 months	Yes	Yes	No	Yes	Yes	Yes	Yes
More detailed	No	No	Yes ⁴	No	No	No	No	No	Yes	No	No	Yes
Currencies												
USD/DEM	No	No	No	Yes	No	No	No	No	No	Yes	No	No
USD/JPY	No	No	No	Yes	No	No	No	No	No	Yes	No	No
USD/domestic	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
DEM/domestic	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
JPY/domestic	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No

¹ Contracts with a maturity of 14 days or less are generally excluded.

² Aggregate future cash flows of all contracts.

³ OEM refers to the Current Exposure Method (replacement/market value basis) for calculating credit exposures under the Basle Capital Accord; OEM refers to the Original Exposure Method whereby credit exposure is assessed as a percentage of notional outstanding.

⁴ Maturity breakdowns only available for aggregate figures.

Table 4

Equity contracts

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Aggregate notional value (stocks)												
Detailed reporting of:												
Futures	No	No	Yes	No	Yes	No	No	No	No	No	No	Yes
Swaps	No	No	No	No	No	No	No	No	No	No	No	Yes
Options (X-traded) o/w Individual shares	No	Yes	Yes, but no split	No	Yes, but no split	No	No	Yes	No	No	No	Yes
Indices	-	No	-	-	-	-	-	Yes	-	-	-	Yes, but no split
o/w Purchased	-	Yes	X-traded/ OTC	-	X-traded/ OTC	-	-	Yes	-	-	-	No
Sold	-	Yes	OTC	-	OTC	-	-	Yes	-	-	-	Yes
Options (OTC) o/w Individual shares	No	No	No	No	-	No	No	No	No	No	No	Yes
Indices	-	-	-	-	-	-	-	-	-	-	-	Yes, but no split
o/w Purchased	-	-	-	-	-	-	-	-	-	-	-	Yes, but no split
Sold	-	-	-	-	-	-	-	-	-	-	-	No
Replacement cost (gross+/-gross-net)												
Detailed reporting of:												
Futures	No	No	No	No	No	No	No	No	No	No	No	No
Swaps	No	No	No	No	No	No	No	No	No	No	No	No
Options (X-traded) o/w Individual shares	No	No	No	No	No	No	No	No	No	No	No	No
Indices	-	-	-	-	-	-	-	-	-	-	-	-
o/w Purchased	-	-	-	-	-	-	-	-	-	-	-	-
Sold	-	-	-	-	-	-	-	-	-	-	-	-
Options (OTC) o/w Individual shares	No	No	No	No	No	No	No	No	No	No	No	No
Indices	-	-	-	-	-	-	-	-	-	-	-	-
o/w Purchased	-	-	-	-	-	-	-	-	-	-	-	-
Sold	-	-	-	-	-	-	-	-	-	-	-	-

Table 4

Equity contracts (continued)

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Maturity												
Below/above one year	No	No	Yes ²	No	Yes ¹	No	No	No	No	No	No	Yes
More detailed	No	No	Yes ²	No	No	No	No	No	No	No	No	Yes
Underlying share prices												
US	No	No	No	No	No	No	No	No	No	No	No	No
Japanese	No	No	No	No	No	No	No	No	No	No	No	No
German	No	No	No	No	No	No	No	No	No	No	No	No
UK	No	No	No	No	No	No	No	No	No	No	No	No
French	No	No	No	No	No	No	No	No	No	No	No	No
Other	No	No	No	No	No	No	No	No	No	No	No	No

¹ Less/more than 18 months.

² Maturity breakdown only available for aggregate figures.

Table 5

Commodity contracts

Item	United States	Japan	Germany	France	Italy	United Kingdom	Canada	Netherlands	Belgium	Sweden	Switzerland	Luxembourg
Aggregate notional value (stocks)												
Detailed reporting of:												
Forwards	No	No	No	No	No	No	No	No	No	No	Yes	Yes
Swaps	No	No	No	No	No	No	No	No	No	No	No	No
Options (X-traded)												
o/w Purchased	No	No	No	No	No	No	No	No	No	No	No	Yes
Sold	-	-	-	-	-	-	-	-	-	-	-	No
Options (OTC)												
o/w Purchased	No	No	No	No	No	No	No	No	No	No	No	Yes
Sold	-	-	-	-	-	-	-	-	-	-	-	No
Replacement cost (gross+gross-net)												
Detailed reporting of:												
Futures	No	No	No	No	No	No	No	No	No	No	No	No
Forwards	No	No	No	No	No	No	No	No	No	No	No	No
Swaps	No	No	No	No	No	No	No	No	No	No	No	No
Options (X-traded)												
o/w Purchased	No	No	No	No	No	No	No	No	No	No	No	No
Sold	-	-	-	-	-	-	-	-	-	-	-	-
Options (OTC)												
o/w Purchased	No	No	No	No	No	No	No	No	No	No	No	No
Sold	-	-	-	-	-	-	-	-	-	-	-	-
Maturity												
Below/above one year	No	No	No	No	No	No	No	No	No	No	No	Yes
More detailed	No	No	No	No	No	No	No	No	No	No	No	Yes
Underlying commodities												
Oil	No	No	No	No	No	No	No	No	No	No	No	No
Metals	-	-	-	-	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-	-	-	-	-

I Only for gold and silver, no split X-traded/OTC.