BANK FOR INTERNATIONAL SETTLEMENTS

PROPOSALS FOR IMPROVING GLOBAL DERIVATIVES MARKET STATISTICS

Report prepared by a Working Group established by the
Euro-currency Standing Committee
of the central banks of the Group of Ten countries

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Preface

The collection of comprehensive and reliable statistics on derivatives markets was advocated by central banks in October 1992, when the Governors of the central banks of the Group of Ten (G-10) countries released the report entitled "Recent Developments in International Interbank Relations" (the Promisel Report). This was followed by a report on "Issues of Measurement Related to Market Size and Macroprudential Risks in Derivatives Markets" (the Brockmeijer Report), which was published in February 1995. The latter report identified central banks' information requirements with regard to derivatives markets and proposed two initiatives towards addressing them: a comprehensive survey of derivatives markets conducted relatively infrequently, and a system for collecting statistics more regularly from a small number of leading international dealers.

The proposal in the Brockmeijer Report for a comprehensive survey culminated in the April 1995 Central Bank Survey Of Derivatives Market Activity. The survey was conducted by central banks and monetary authorities in 26 countries, in conjunction with the Bank for International Settlements and with the cooperation of the international financial community. The results of the survey, which are described in detail in "Central Bank Survey of Foreign Exchange and Derivatives Market Activity" (BIS, May 1996), provided information on several important aspects of these markets which had previously been unavailable. Nevertheless, in view of the rapid development of global financial markets, it must be concluded that infrequent surveys are not sufficient to provide a timely picture of many aspects of derivatives activity.

Against this background, the Euro-currency Standing Committee of the central banks of the G-10 countries (ECSC) last year asked a Working Group to develop a proposal for the more regular collection of derivatives statistics. The Group, which was chaired by Shinichi Yoshikuni of the Bank of Japan, delivered its report to the G-10 Governors in July 1996. The present report summarises the group's principal findings and recommendations. It is being released in order to finalise, with the input of market participants and supervisors, a framework for the regular collection of derivatives market data to be implemented at the end of 1997. It also recommends that central bank experts examine whether it is desirable to conduct another global survey of derivatives markets in conjunction with the next foreign exchange market survey, envisaged in 1998.

In addition, the report provides an initial discussion of possible routes to monitoring price risks and exposures in international financial markets in a broader context than derivative alone. These systemic aspects of financial markets have long been a concern of central banks, but techniques for monitoring them have not been explored in detail either theoretically or quantitatively.

After an introductory section, Part II of the report reviews the results of the April 1995 survey and assesses the implications of the survey results and participants' experiences for the regular reporting effort. Part III describes the Working Group's proposed reporting framework for derivatives activity and presents motivations for the specific components of the framework. Part IV attempts to address some of the broader issues relating to central bank monitoring of the financial system, and is intended to stimulate research and discussion on these topics in the financial community as well as in central bank and supervisory circles. Each of these sections is meant to serve as a self-contained unit.

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I. INTRODUCTION AND SUMMARY

Central banks have for some time recognised the need for statistics which would cover activity in global derivatives markets. Such statistics, if sufficiently comprehensive and informative, would increase market transparency and facilitate monitoring by central banks of the macroeconomic and macroprudential aspects of these markets. Since derivatives trading is conducted on a global scale, such statistics must be global in their coverage and consistent internationally. Other national authorities, trade groups and market participants have also recognised the value of such an effort in improving market transparency and functioning. In this context, this report reviews central banks' experiences in this field and explores various options for enhancing statistical coverage and understanding of global derivatives markets, while at the same time limiting the burdens imposed on reporting institutions.

1. The Brockmeijer Report and the April 1995 derivatives survey

1.1 The Brockmeijer Report

In October 1992, the central banks of the Group of Ten (G-10) countries released the report entitled "Recent Developments in International Interbank Relations" (the Promisel Report). This report summarised findings on the activities of banks in non-traditional markets, notably the markets for derivative instruments, and pointed out that there existed a need for better statistics on over-the-counter derivatives markets worldwide.

To follow up this work, a working group established by the Euro-currency Standing Committee (ECSC) of the G-10 central banks and chaired by Jan Brockmeijer of the Netherlands Bank was asked to identify the principal macroeconomic and macroprudential information requirements of central banks in relation to global derivatives market activity, and to develop measurement concepts and monitoring techniques that would address those concerns and lend themselves to consistent international implementation. The report of this working group, "Issues of Measurement Related to Market Size and Macroprudential Risks in Derivatives Markets" (the Brockmeijer Report), was published in February 1995. The report recommended that central banks monitor the role of derivatives markets in the trading and transfer of risks among agents with a view to assessing their possible implications for the conduct of monetary policy. From the macroprudential perspective, it recommended that central banks monitor developments in the concentration and liquidity of derivatives markets, as well as the price dynamics and market linkages engendered by these markets. The report concluded that a number of these information needs could be addressed by appropriately constructed market size statistics.

The Brockmeijer group examined existing statistics on derivatives markets and found that they had several shortcomings with respect to central banks' statistical needs. First, existing statistics were in terms of notional amounts, and therefore shed little light on the economic value of risk transfers carried out in derivatives markets. Second, the lack of comparability among existing data sets hindered efforts to compile global statistics. A third problem was the low level of detail available for certain markets. In response to these shortcomings, the report made two complementary recommendations for internationally coordinated efforts by central banks to collect statistics on derivatives markets. One was a comprehensive survey of markets conducted at relatively long intervals, to be carried out in conjunction with the existing triennial Central Bank Survey of Foreign Exchange Market Activity. Another was to collect statistics more regularly from a small number of leading international dealers, on the basis of a framework to be drawn up in the light of the results of the survey.

1.2 The April 1995 derivatives market survey

The first proposal culminated in the April 1995 Central Bank Survey of Derivatives Market Activity, which was conducted by the central banks and monetary authorities of 26 countries and coordinated by the Bank for International Settlements, with the cooperation of the international financial community. The survey, the first comprehensive, internationally coordinated effort of its kind, covered traditional foreign exchange instruments, such as foreign exchange forwards and swaps, as well as currency swaps and options and forward, swap and option transactions in interest rate, equity and commodity markets, a broader product spectrum than in previous surveys.[1]

The preliminary results of the survey were released on 18th December 1995. The total reported notional amount of over-the-counter derivatives outstanding at end-March 1995 was approximately $41 trillion. The total reported gross market value, which is more closely related to (while still distinct from) the credit risks involved in these markets, amounted to $1.8 trillion, less than 1/20 of notional amounts. The final report on the survey, which was issued by the BIS in May 1996, estimates adjustments for gaps in reporting that would increase these figures to $47.5 trillion and $2.2 trillion respectively. The survey totals were higher than had been expected on the basis of previous studies, though they may have been inflated somewhat by the inclusion of "arm`s-length" transactions between affiliates of the same financial institution. More than half of the trades reported in the survey were "cross-border", a fact which emphasises the global nature of these markets. Part II of this report contains a brief assessment of the survey results and the lessons that can be drawn from them with regard to future data collection efforts. A more detailed presentation of the results is contained in Annex 1 to this report and in the final survey report, "Central Bank Survey of Foreign Exchange and Derivatives Market Activity" (BIS, May 1996).

2. The regular collection of derivatives market statistics

The April 1995 survey made a significant contribution to increasing the transparency of over-the-counter derivatives markets worldwide and gave central banks and market participants valuable insights into their structure. The survey results and market participants' experience with the survey process itself have been taken into account in the development of the Working Group's proposal for a regular statistical reporting framework for financial institutions' derivatives activities. The framework is presented in Part III of this report.

The proposed reporting framework would collect data on reporting firms' outstanding derivatives positions (notional amounts and gross positive and negative market values), broken down by instrument, currency, maturity and counterparty type. Firms would also report their overall exposures related to derivatives, both before and after netting. Institutions would report on their global activities on a consolidated basis. The structure of the reporting framework has been designed to be as consistent as possible with the reporting requirements of the "common minimum information framework" published in May 1995 by the Basle Committee on Banking Supervision and the Technical Committee of the International Organization of Securities Commissions (IOSCO). Most of the items requested in the proposed framework are more detailed breakdowns of items requested in the supervisors' framework. Data would initially be collected on a semi-annual basis, though the possibility of a move to quarterly reporting at a later date would be left open. The reporting population would comprise those firms collectively accounting for a substantial part of derivatives activity as reported in the April 1995 derivatives market survey. The data provided would be aggregated nationally, and national data would in turn be reported to the BIS for global aggregation. Regulators represented on the IOSCO Technical Committee have offered to assist in obtaining data from firms that fall under their regulatory jurisdiction.

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[1] All of these instruments will be referred to in this report as "derivatives".

The Working Group was particularly concerned to limit the burden of the proposed framework on reporters, and minimising increases in reporting costs was a focal point in the Group's discussions with market participants. While the Working Group recognised that the initial burden involved in implementing the reporting scheme might prove considerable for some firms, it took the view that the structure of the exercise would be consistent with general trends in the development of information systems in financial institutions. These aim at establishing booking, computing and communications systems that will enable consolidated risk management across a wide range of market and credit risk factors and timely reporting to top management. The Working Group expects that consolidated risk management systems would be the principal source of data for the reporting framework and that the costs of reporting would fall significantly over time.

3. Recommendations and options for future work

The Working Group recommends that the reporting framework proposed in this report be finalised in consultation with market participants, supervisors and central bank statisticians and implemented at the end of 1997. To balance the need for early data collection and the minimisation of initial reporting burdens, the Group recommends that the framework be implemented gradually. Accordingly, some aspects of implementation, such as final criteria for timeliness, would be delayed until the end of 1999.

The Working Group carefully considered whether to recommend continuing the comprehensive central bank derivatives market survey. It was agreed that the 1995 survey had been a valuable exercise that produced a great deal of useful information. It was also clear that future surveys could potentially complement regular reporting by providing benchmark data and useful information not covered by the regular reporting framework, such as trading in non-G-10 centres, turnover, trade location and currency pairings.

However, the Group concluded that it would be premature, at this juncture, to recommend a repeat of the derivatives survey in 1998. Developments in supervisory and private sector data-gathering efforts may satisfy some of the needs outlined above. Furthermore, the end-1997 target date for implementation of the regular reporting framework would coincide with preparations for the next central bank survey, which might pose an excessive burden for reporters. The Group therefore recommends that central bank experts closely follow developments in this area and, if necessary, take appropriate steps in coordination with their foreign exchange colleagues to prepare for the inclusion of derivatives market data in the 1998 central bank foreign exchange market survey.

During the course of its discussions, the Working Group also considered, on a preliminary basis, ways of measuring market risks that encompass the reporting of risks taken through both derivatives and cash market positions. These techniques, and the possible need to expand coverage beyond derivatives, were also identified by the Brockmeijer Report as a field warranting coordinated central bank study. Part IV of the present report contains a preliminary examination of issues involved in the aggregation of portfolio risk measures and offers some thoughts on a course for continuing central bank involvement in this area.

II. THE SURVEY OF DERIVATIVES MARKET ACTIVITY

The Central Bank Survey of Derivatives Market Activity was carried out in conjunction with the triennial Central Bank Survey of Foreign Exchange Market Activity in April 1995. It was intended to provide an initial overview of the size and structure of these markets. More than 2,400 institutions in 26 countries took part.

The survey measured turnover of foreign exchange and interest rate derivative instruments, as well as outstanding notional amounts and market values of foreign exchange, interest rate, equity and commodity derivative instruments. Outstanding amounts were measured as at 31st March, 1995, and average daily turnover was calculated over the month of April. Data were reported on a trade location basis. The survey focused primarily on over-the-counter (OTC) markets, but also collected data on participants' exchange-traded derivatives business.[2]

A. Analysis of the survey results

1. General overview

After adjustment for double-counting, the notional amount of outstanding OTC foreign exchange, interest rate, equity and commodity contracts reported in the survey totalled $40.6 trillion (Table 1). Participants also reported a notional amount of $16.4 trillion in exchange-traded derivatives outstanding; however, this figure has not been adjusted for double-counting and is therefore not directly comparable with the OTC figures. Single-currency interest rate contracts accounted for 66% of the total OTC notional amount, contracts involving foreign exchange for 32% and those involving equity and commodity prices for 1% each.

The gross market value of outstanding OTC contracts stood at $1.8 trillion at the time of the survey. This was equivalent to 4% of the reported notional amounts. A disproportionate share (59%) of the gross market value was accounted for by foreign exchange contracts, with interest rate contracts accounting for 37% and equity and commodity contracts for 3% and 2% respectively.[3]

Annex 1 to the present report sets out the results of the survey in more detail. The remainder of this section considers two specific aspects of the survey results that are relevant to the work of the Working Group: how the survey results compare with previous surveys of these markets, and what the results reveal about the economic, monetary and macroprudential issues raised by the Brockmeijer Report.

2. Comparison with earlier estimates

The results of the central bank survey can usefully be compared with results from other sources. For example, estimates by *Swaps Monitor*[4] and surveys by the International Swaps and Derivatives Association (ISDA) cover some of the same ground as the central bank survey. An

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[2] Samples of the survey forms, explanatory notes and a discussion of the statistical methodology were included as annexes to the Brockmeijer Report.

[3] Statistical adjustments for gaps in reporting produce an estimated total notional amount of $47.5 trillion and an estimated total gross market value of $2.2 trillion. The gaps resulted from less than full coverage of derivatives markets in the reporting countries, most notably missing data on outright forwards and foreign exchange swaps in the United Kingdom. Figures in this section and in Annex 1 employ the "raw" reported data, not the adjusted data.

[4] "Notional outstandings jumped sharply in 1994", *Swaps Monitor* Vol. 8, No. 11 (20th March 1995), p. 10, and "Replacement cost fell $100 billion last year," Ibid., Vol. 8, No. 13 (17th April 1995), p. 2.

important caveat must be applied to such comparisons, however: a major reason for conducting the central bank survey was the perceived lack of comprehensive aggregate data on OTC derivatives markets. The central bank survey was therefore more comprehensive than any other survey previously conducted.

Table 1

Global notional amounts and gross market values of OTC derivative contracts outstanding at 31st March 1995

(in billions of US dollars)

Category	Foreign exchange		Interest rates		Equity and stock indices[1]		Commodities[1]	
	Notional amounts	Gross market values	Notional amounts	Gross market values	Notional amounts	Gross market values	Notional amounts	Gross market values
Total reported gross amounts outstanding	**20,217**	**1,624**	**42,377**	**982**	**780**	**74**	**389**	**32**
with local dealers	5,078	391	13,512	301	201	25	72	5
with dealers abroad	9,164	718	17,952	383	201	24	71	4
with others	5,974	515	10,913	295	373	25	245	23
Total reported "net-net" amounts outstanding[2]	**13,095**	**1,048**	**26,645**	**647**	**579**	**50**	**318**	**28**

[1] Local dealers and dealers abroad are each assumed to have accounted for half of total business with other dealers. [2] The adjustments to notional amounts outstanding have been calculated by halving positions vis-à-vis other local reporting dealers and other reporting dealers abroad respectively. The adjustments to gross market values have been calculated by deducting negative market value exposure to other local reporting dealers and other reporting dealers abroad respectively from the sum of total gross positive and negative market values.

Absolute figures from the central bank survey are substantially larger than the estimates in previous surveys. One reason for the larger overall figures is that the central bank survey includes amounts for foreign exchange forwards and swaps along with less "traditional" instruments. Figures for specific categories were larger as well, however, because of the larger number of survey respondents and because of the inclusion of intra-firm transactions conducted on arm's-length terms. For example, the total for interest rate swaps outstanding was approximately $18 trillion, compared with approximately $8.8 trillion in the end-1994 ISDA survey and $12.1 trillion in the end-1994 *Swaps Monitor* estimate. Such differences between the results of the central bank survey and earlier figures should be attributed to the different bases on which the surveys were conducted, and should not necessarily be interpreted as growth in the OTC derivatives market from one survey date to the next.

While differences in the reporting populations make it difficult to compare absolute figures from the different surveys, one can still gain insights by comparing the sizes of various sub-categories in the different surveys relative to the overall figures. For example, as Table 2 shows, one can compare the percentages accounted for by different products in terms of notional amounts outstanding. Interest rate swaps constituted 53.8% of the outstanding notional amounts as estimated by *Swaps Monitor*, but 57.7% in the central bank survey. Forward rate agreements (FRAs), on the other hand, made up a relatively larger share (22.2%) of the *Swaps Monitor* total, compared with a share of 14.5% in the central bank total. The differences in the shares accounted for by interest rate instruments could perhaps be explained by the wider geographical coverage of the central bank

survey: in many of the centres covered by the central bank survey but not by *Swaps Monitor* there was relatively more activity in swaps or interest rate futures and less in FRAs.

Table 2

Notional amounts outstanding

(as a percentage of the total)

Instrument	***Swaps Monitor* estimate** (end-1994)	**Central bank survey** (31st March 1995)
Interest rate swaps	53.8	57.7
FRAs	22.2	14.5
Interest rate options	10.2	11.2
Currency swaps	5.8	6.2
FX options	5.3	7.5
Commodity & equity derivatives	2.7	2.8
Total	**$22.5 trillion**	**$31.7 trillion**

Table 3 shows gross positive market value as a percentage of the notional amount outstanding for various instruments in the *Swaps Monitor* estimates and the central bank survey. Here, the figures for interest rate derivatives are roughly similar in the two sources. However, the foreign exchange derivatives figures from the central bank survey are substantially higher than those estimated by *Swaps Monitor*. This may in part reflect sharp movements in the underlying markets before and during the survey period.

Table 3

Gross positive market value as a percentage of notional amount outstanding

Instrument	***Swaps Monitor* estimate** (end-1994)	**Central bank survey** (31st March 1995)
Interest rate swaps	1.2	2.4
FRAs	0.1	0.4
Interest rate options	0.7	2.7
Currency swaps	6.2	12.0
FX forwards & swaps	1.1	5.8
FX options	2.2	4.3
All instruments	**1.2**	**3.6**

Another comparison worth drawing between the central bank survey and earlier estimates is the share of different currencies in interest rate swaps, as Table 4 demonstrates. These figures are broadly comparable, suggesting that the US dollar and the yen are the major currencies in interest rate swaps, accounting for about one-third and about one-quarter of the total notional amount respectively.

Table 4

Currency breakdown of interest rate swaps, by notional amount

(in percentages)

Currency	**ISDA survey** (end-1994)	**Central bank survey** (31st March 1995)
US dollar	36.6	33.3
Yen	22.5	25.1
Deutsche Mark	10.3	11.4
Other	30.6	30.2
Total	**$8.8 trillion**	**$18.3 trillion**

ISDA publishes information on the maturity breakdown of interest rate and currency swaps. These figures are compared with those from the central bank survey in Table 5. The breakdowns are broadly comparable, although the central bank survey finds a relatively higher degree of activity in shorter maturities.

Table 5

Maturity breakdown of interest rate and currency swaps, by notional amount

(in percentages)

	ISDA survey (end-1994)	**Central bank survey** (31st March 1995)
Interest rate swaps		
Up to 5 years	76	84
Over 5 years	24	16
Currency swaps		
Up to 5 years	66	76
Over 5 years	34	24

The central bank survey did not attempt to collect comprehensive data on exchange-traded derivatives because these are available from the exchanges. The exchange-traded data that were reported could not be corrected for double-counting. However, it is interesting to see what share of the activity reported by the exchanges was also reported by the survey participants. Table 6 estimates these shares, using turnover figures reported by the exchanges for the predominant contract in certain currency/maturity categories and those reported to the central bank survey for those categories.

Although this comparison is, of course, far from perfect, it is clear that the survey participants are active in the exchange-traded markets: about 50% of daily turnover, on average, seems to have found its way onto the survey reporting forms.[5]

Table 6

Share of exchange-traded derivatives turnover accounted for by survey reporters

(April 1995; in billions of US dollars and in percentages)

Contract[1]	Average daily turnover	Daily turnover by survey reporters[2]
Futures on interest rates up to one year		
Three-month eurodollar	378.8	96.5 (25%)
Three-month euro-DM	65.1	39.2 (60%)
Three-month euroyen.....	244.0	191.7 (79%)
Futures on interest rates over one year		
US Treasury bond	31.0	18.6 (60%)
Bund	26.7	14.1 (53%)
Japanese 10-year government bond.....	70.3	40.8 (58%)
Total	**815.9**	**401.0 (49%)**

[1] The most commonly traded contract for interest rates under one year and over one year, respectively. The turnover figure for each contract is the total daily volume for all exchanges on which each contract is traded. [2] Figures have been halved to adjust approximately for double-counting and to make them comparable with data from the exchanges.

Sources for Tables 2-6: Swaps Monitor, ISDA, Futures Industry Association and BIS calculations.

In discussions with some of the reporters, the view was expressed that exchange-traded positions are used primarily to hedge OTC positions. However, the different shares of the various contracts accounted for by survey reporters do not necessarily reflect different positions in the OTC markets: they may to some extent reflect structural differences in the different markets. For example, some exchanges have a greater involvement of "locals" (small proprietary traders), and on others relatively less business is conducted through brokers.

3. Usefulness of the data for central banks' macroeconomic and macroprudential information needs

The Brockmeijer Report divided the information needs of central banks in relation to derivatives markets into three broad categories: those relating to the economic effects of derivatives, those relating to monetary policy, and those relating to macroprudential issues. The central bank survey was not designed to answer every one of these needs, and many of the issues raised can only

[5] Since the figures reported in the second column of Table 6 are for only one specific contract in each currency/maturity category, the percentages in the third column are necessarily greater than the actual shares of survey reporters in the corresponding sectors. For example, turnover for the US 20-year Treasury bond contract is given, but *total* turnover for futures on US dollar interest rates over one year would include other contracts, such as the 10-year US Treasury note.

be addressed by examining the evolution of the figures collected by the survey over time. Nevertheless, analysis of the survey results can provide some initial insights into several of these questions.

3.1 Economic effects of derivatives

Derivatives are thought to improve economic efficiency by facilitating the reallocation of risks to those most willing to bear them. This can reduce the cost of risky activities, and of investment in particular. Ideally, a dealer in derivatives takes on risks that a non-financial entity (or a financial institution that is not a dealer) is unwilling to bear. The dealer can either retain this exposure, judging that it hedges some other exposure or otherwise does not excessively threaten the dealer's risk profile, or it can trade the exposure with another dealer, who makes the same calculation in turn.

The survey obviously could not reveal whether improved risk bearing resulted in greater economic efficiency, or indeed whether the reported transactions fit the model described above. However, it is interesting to note that, according to the survey results, derivative contracts entered into by non-dealers are relatively more likely to be in the form of an option than those entered into between dealers. Of OTC foreign exchange contracts outstanding, 16% (by notional amount) of those between dealers are option-like, compared with 21% of those involving non-dealers. The comparable figures for single-currency interest rate contracts are 9% and 19%. This pattern does not hold for equity or commodity contracts, though it is possible that in these cases exchange-traded contracts are relatively more likely to be used for the taking of forward positions.

This may suggest that non-dealers are relatively more likely than dealers to use derivatives to insure themselves against extreme price movements through the use of options. Such a view would be supported by the fact that, in almost every category, dealers sold more options to non-dealers than they purchased from them. For example, $680 billion of foreign exchange derivatives outstanding, by notional amount, are options sold by dealers to non-dealers, while options purchased from non-dealers by dealers amount to $582 billion. For single-currency interest rates, the comparable figures are $1205 billion and $877 billion. Many of the options purchased from non-dealers may well be part of "collars", contracts under which, for example, a customer purchases an option that puts a "ceiling" on an interest or exchange rate in return for selling the dealer a "floor" on the same rate.

3.2 Effects of derivatives on the transmission of monetary policy and on the interpretation of monetary indicators

Financial derivatives may affect the sensitivity of some economic variables to monetary policy changes. For example, if a financial institution has swapped the floating rate exposure from its short-term liabilities into fixed rate payments, a policy-induced increase in short-term interest rates is unlikely to restrict the activity of this institution as much as it might have had there been no swap. Another example would be an exporter which has entered into forward contracts converting its foreign currency revenues into domestic currency revenues at a fixed rate. A change in the exchange rate would be expected to have less impact on such an exporter's cash flows. In both of these cases, however, the effects of the changed interest or exchange rate would only be postponed until the expiration of the contract. These and other possible effects were analysed in detail in "Macroeconomic and Monetary Policy Issues Raised by the Growth of Derivatives Markets" (the Hannoun Report), which was published by the BIS in November 1994.

The possible significance of such effects is of course difficult to assess using the broad, one-time figures that were collected in the survey. However, an attempt can be made to determine, in qualitative as opposed to quantitative terms, whether the exposures to interest and exchange rates taken through the derivatives positions reported in the survey are large enough, relative to exposures created by more conventional kinds of activity, to have a potential impact on the transmission of monetary policy.

There are a number of different ways to determine whether the market size figures reported in the survey are "large" relative to conventional financial markets. One perspective is offered by the fact that, according to BIS figures, roughly $24.4 trillion of domestic and international debt securities were outstanding worldwide at the end of 1994.[6] This is very close to the global notional amount of $26.6 trillion of single-currency interest rate derivatives reported in the survey. One can thus conclude that the presence of derivatives has indeed had a significant effect on the exposure of a large number of economic agents to interest rate changes.

The direction of this change in exposure, however, is less clear, in the absence of more detailed information on the kinds of exposures taken and hedged through derivatives by different classes of agents. John Kambhu, Frank Keane and Catherine Benadon[7] suggest that, since the contracts reported in the survey had remaining maturities roughly half those of the global securities monitored by the BIS, the durations may have been half as large as well, with the result that the derivative contracts taken as a whole would have created an interest rate sensitivity for their holders about half as large as that created by the global securities market.[8] Derivatives thus may well have the potential to affect the distribution of the impact of interest rate changes across institutions. To determine whether they actually do so at any given time, however, would require more detail about the overall balance-sheet positions of participants in these markets than a survey limited to derivatives markets provides.

Of the $24.4 trillion of global debt securities at end-1994 mentioned above, roughly $2.5 trillion were "international" issues, defined as those issued by residents in foreign markets or in foreign currency in local markets (excluding certain local currency issues in foreign markets). International bank credit activity added a further $8.4 trillion to BIS figures for international financing. The sum of these amounts, $10.9 trillion, is somewhat less than the $13.1 trillion in notional amount of foreign exchange contracts reported in the survey. In other words, the exposures to exchange rate movements taken in these markets are probably larger than those taken in international credit markets. This derives from the fact that a certain amount of foreign exchange derivatives business is unrelated to securities issuance or credit activity, and instead facilitates the hedging of trade and income flows, the hedging of the inventories of derivatives dealers and the taking of speculative positions. In particular, the "traditional" foreign exchange derivative contracts, i.e. foreign exchange forwards and foreign exchange swaps, may be more likely to be used to hedge trade and income flows, while more recently developed products are usually associated with capital market activities. The overall foreign exchange derivatives figures thus suggest that, as with interest rate derivatives, foreign exchange derivatives holdings have at least the potential to affect the working of the "exchange rate channel" of monetary policy.

3.3 Macroprudential effects of derivatives

Concerns have sometimes been expressed that derivatives increase the likelihood of a localised disruption affecting a key financial intermediary or market spreading rapidly to other parts of the financial system. These concerns focus on the ease of taking on large amounts of leverage through derivative contracts, which could lead to excessive market pressure during a large price move, and on the limited transparency of derivatives markets, which could lead to some market participants misjudging the likely actions of others. A possible consequence could be the drying-up of liquidity in certain markets, which would then have a negative effect on participants' perceptions of liquidity in other markets - a classic "bank run" scenario.

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6 The domestic portion of this figure includes only securities issued in OECD countries.

7 "Price Risk Intermediation in the Over-the-Counter Derivatives Markets: Interpretation of a Global Survey", *FRBNY Economic Policy Review*, April 1996.

8 Of course, the interest rate sensitivity of derivatives will also reflect the maturity of the underlying instrument, and the duration/maturity relationship depends on a host of factors specific to the instrument concerned.

The default of a large dealer would be of concern if, as a result, the dealer were unable to fulfil its side of contracts that are positive in value to other market participants. This gross positive market value, however, is not an exact measure of credit risk. In practice, gross market value represents an overstatement of credit exposure in OTC markets, because such exposures can be reduced through the use of netting, collateral arrangements and guarantees. The gross market values reported to the survey were further exaggerated by the inclusion of certain intra-firm transactions.

Bearing these distinctions in mind, the survey's gross market value figures seem to suggest that the replacement risks taken by firms through open positions in OTC derivatives are small relative to the corresponding notional amounts. The gross market value of all contracts was $1.8 trillion, or roughly 4.4% of their notional value. This ratio was 8% for foreign exchange contracts, 2.4% for interest rate contracts, 8.6% for equity contracts and 8.8% for commodity contracts.

The figures for foreign exchange contracts should be viewed in the light of the fact that the survey date, 31st March 1995, followed a period of relatively sharp movements in foreign exchange markets. The US dollar had fallen by 8.8% against the Japanese yen in the previous month and by 11.5% in the previous three months. Against the Deutsche Mark, the dollar had declined by 5.3% and 10.7% over the same two periods. The 8% ratio of the gross positive market value of foreign exchange contracts to their notional amounts outstanding is roughly in line with these market movements. It suggests that the market values of derivatives positions reflected, but were not amplified by, the price risks created by exchange rate movements.

Another sign that the financial system may be vulnerable to this kind of disruption in liquidity would be a sharp movement in the net market value of dealers' positions. If end-users, as a group, hedge similar risks in similar directions through derivatives markets, then the possibility exists that a market movement would lead to large net losses for dealers as a whole, possibly leading one or more of them to withdraw from the market.

However, the counterparty breakdowns reported in the survey reveal that the reporting dealers, taken as a whole, had balanced their derivatives-related exposures rather well. The gross positive market value of dealers' foreign exchange contracts with non-dealers (that is, the total amount owed to dealers by non-dealers as a result of the contracts) was $263 billion, compared with a gross negative market value (the total amount owed to non-dealers by dealers) of $252 billion. The comparable figures for single-currency interest rate contracts were $151 billion and $145 billion. These figures indicate that the dealer sector as a whole was acting as an intermediary rather than taking large positions in OTC derivatives markets. The overall figures say nothing about whether individual dealers were as balanced as dealers as a whole seem to have been. Nevertheless, the figures should reassure those concerned about the macroprudential risks posed by derivatives markets, since they reveal an absence of a concentration of market risk exposures among dealers as a group.

Concerns could be heightened if markets were found to be highly concentrated.[9] While investigation of the concentration characteristics of the survey data has only just begun, figures calculated by some central banks suggest that concentration varies widely across national markets, as shown in Table 7. For example, the top ten institutions account for roughly 96% of the turnover of OTC foreign exchange contracts in France, but only 52% of turnover in Japan. In the United States, it was found that, though most specific instrument categories were dominated by a small number of firms, broader categories (such as all foreign exchange contracts) were significantly less concentrated. In other words, firms seem to specialise in specific instruments or risk factors.

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9 Concentration need not always be a macroprudential concern. For example, it may be the case that, in a given market segment, market disruptions are less likely if trading is dominated by a small number of experienced, knowledgeable participants.

Table 7

Concentration of OTC derivatives activity in selected countries

	France	Japan	United Kingdom	United States
percentage of turnover accounted for by top ten institutions				
Total OTC contracts	-	48	54*	-
FX contracts	96	52	69*	-
FX options	-	57	75	-
Interest rate contracts	81	61	56	-
percentage of notional amounts outstanding accounted for by top ten institutions				
Total OTC contracts	-	-	48*	61
FX contracts	79	-	67*	75
Interest rate contracts	85	-	63	65

***** Excludes outright forwards and FX swaps.

Sources: Bulletin de la Banque de France, Bank of Japan Quarterly Bulletin, Federal Reserve Bank of New York and Bank of England.

B. Lessons of the survey for regular reporting

A principal purpose of the central bank survey was to lay the groundwork for the regular reporting system. It was to establish the broad outlines of the market's structure and permit an assessment of the burdens posed by specific items. This section reviews some of the lessons that can be drawn for the regular reporting framework from the survey results and from the experiences of survey participants and central banks in implementing the survey.

1. Meaningfulness of specific items and breakdowns

1.1 Currency breakdowns

The survey confirmed that the US dollar, the Japanese yen and the Deutsche Mark are the three most commonly used currencies in OTC derivative contracts. It also suggested that the US dollar is nearly always the base currency for foreign exchange derivative transactions. Of the $13.1 trillion notional amount of outstanding foreign exchange contracts, only $2.4 trillion (about 18%) did not have the dollar on at least one side, and only $737 billion (less than 6%) did not have one of the three major currencies. This suggests that a "single-currency" breakdown of foreign exchange contracts, where each contract is reported separately according to each of the two currencies of which it is composed, will capture most of the relevant information regarding these instruments.[10]

Among single-currency interest rate contracts, however, the survey found $8.4 trillion notional amount of contracts in currencies other than the dollar, Deutsche Mark and yen, amounting to 32% of the total. This suggests that a relatively extensive currency breakdown for these instruments may well be necessary for an adequately detailed picture of the interest rate derivatives markets.

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[10] Section 2.5 of Part III.B below explains how a single-currency breakdown of foreign exchange contracts would work.

1.2 Concentration

The results of the survey confirmed that a small number of large intermediaries accounted for a substantial part of the global derivatives market. Thus, a relatively small population would suffice for regular reporting.

1.3 Cross-border trades

The survey illustrated the global nature of derivatives markets. Roughly $4.6 trillion of the notional amount of outstanding foreign exchange contracts, 35% of the total, were with reporters in other countries. The picture is almost identical for single-currency interest rate contracts, of which 34% ($9 trillion) were cross-border. This points to the need for international coordination in the formulation of derivatives reporting systems.

1.4 Trade location

The survey cast serious doubt on the concept of the "location" of a derivatives trade, as did the comments by some participants to the effect that they book all of their global business in certain market segments in a single branch or subsidiary (such as booking all foreign exchange contracts in London). Reported information on outstanding amounts in one centre thus may not give a fully accurate picture of activity in that centre. This suggests that the use of consolidated reporting (as explained below), rather than reporting by location, will not be especially costly in terms of lost information about activity in specific national centres.

1.5 Commodity derivatives markets

The survey revealed that markets for derivative instruments with a commodity price or index as their underlying value are quite small relative to those for financial derivatives. A notional amount of only $318 billion was reported, compared with $13.1 trillion of foreign exchange derivatives and $26.6 trillion of single-currency interest rate derivatives. Although the figure for commodity derivatives probably understates the true amount, because non-financial commodities dealers were not included in the survey, it is likely that these markets are too small to merit detailed inclusion in regular reporting.

1.6 The "other products" category

When the survey categories were being decided upon, there was some concern that the broad instrument categories used in the survey, namely forwards, swaps and options, would fail to capture a significant number of "exotic" or "structured" derivative products. However, participants seem to have had no trouble allocating virtually all contracts to one of the conventional categories. Only a $61 billion notional amount of "other products" was reported in the foreign exchange category, and only $216 billion in the interest rate category. Even these amounts may represent misreporting by some survey participants rather than activity in structured products. This suggests that a breakdown into forwards, swaps and options will capture virtually all market activity, at least as the market is presently structured.

2. Views of participants on the survey and on reporting issues

Members of the Working Group held discussions with survey participants regarding their experiences with the survey. They held similar talks with likely participants in regular derivatives market reporting. This section reviews the results of these discussions.

2.1 Overall burden

On the whole, participants thought the survey had been a useful exercise even if it had represented a considerable burden in some cases. Many firms said that they had not had sufficient time prior to the date of the survey to prepare their information systems sufficiently. The burden had been greater for smaller firms, some of which said that the exercise of assessing their derivatives positions had proved to be a valuable learning experience.

A common concern regarding the establishment of a regular reporting framework was the difficulties caused by simultaneously having to satisfy the reporting and data-processing requirements of several recent regulatory and disclosure initiatives - including the Basle Committee's market risk proposal, the move by some institutions to disclose the performance of their risk management systems and the Capital Adequacy Directive in European Union countries - as well as the need to prepare for European monetary union. Some firms noted that, because profit margins for derivatives dealers have narrowed in recent years, fewer resources will be available for the redesign of their information systems.

2.2 Difficulty of collecting turnover data

The reporting of turnover data had proved particularly onerous: since such data are not normally collected for any other internal purpose, many firms - even large ones - had to resort to manual compilation. Other firms, however, found turnover data to be a valuable indicator of market liquidity, despite the burdens associated with collection. Though the Working Group felt that regular, reliable turnover data would provide an important function in enhancing market transparency, the collection of turnover data is not envisaged as part of the regular reporting framework.

2.3 Currency breakdowns

Though currency breakdowns were burdensome for some institutions, nearly all reported that, if currency breakdowns were to be collected in regular reporting, additional currency detail would not add significant extra costs. A number of market participants expressed a preference for reporting on the basis of single currencies, as opposed to currency pairs, on the grounds that this conformed to the structure of their risk management systems. While some participants felt that currency-pair data would be more informative, the majority opinion seemed to favour single-currency reporting.

2.4 Counterparty breakdowns

Counterparty breakdowns seemed to present particular problems both in the survey and for regular reporting, though for some a reporter/non-reporter breakdown poses the greater difficulty, and for others a financial/non-financial breakdown is more difficult. Several institutions said that these breakdowns would be readily available for notional amounts and for credit exposures, but would be substantially more difficult to generate for gross market values.

2.5 Consolidated reporting

Several institutions reported that the task of consolidating figures from divisions and subsidiaries with differing information systems would present formidable logistical difficulties.

2.6 Stability of categories and breakdowns

A number of institutions expressed the view that, once implemented, any reporting framework should be changed as infrequently as possible. This would facilitate the programming of information systems for regular production of the requested data. In particular, several firms suggested that, in order to reduce the burden posed by counterparty breakdowns, the list of reporting institutions should be kept stable for several years at a time.

2.7 Significance of market value figures as measures of credit risk

Market participants have doubts as to the usefulness of gross positive and negative market values. Notional amounts outstanding attract more interest because they permit institutions to calculate their share of specific markets. Data on derivatives-related market values, however, are thought to be of little use without analogous data on cash instrument market values. In addition, the significance of quantitative data on gross market values, and particularly gross negative values, could be misunderstood by the general public.

III. A REGULAR REPORTING FRAMEWORK FOR DERIVATIVES

A. The need for regular reporting

As the previous section has shown, the April 1995 survey yielded important quantitative information about the role of derivatives markets in the allocation of risk in the global financial system. The figures on notional amounts outstanding demonstrated that the gross risk exposures traded in derivatives markets are similar in scale to those traded in cash markets. The figures on gross positive and negative market values suggested that reporting dealers, as a group, tend to balance the exposures created by their positions in OTC derivatives markets. The survey results thus offer evidence that dealers, as a group, intermediate price exposures in these markets. While these conclusions are not necessarily surprising, having to some degree been borne out by available figures and anecdotal accounts relating to particular markets, the survey offered strong evidence confirming these conclusions on a global level for a wide variety of markets and instruments.

However, this "snapshot" of global derivatives markets, while answering some questions, still leaves many others unanswered. For example, although traders did not report unusual levels of activity at the time of the survey, several market prices, especially foreign exchange rates, had moved sharply in the weeks immediately preceding the survey date. It is therefore not possible to ascertain whether the notional or market value numbers were "typical". Some market participants thought market values at the time of the survey were unusually high. To test the accuracy of such an assertion, one would need to observe market value figures over a period of time.

This section reviews central banks' motivations for the collection of derivatives market data in general, and in particular the need for collection of these data on a semi-annual or more frequent basis. It then discusses the specific motivations for each of the three major components of the framework: notional amounts outstanding of specific derivative instrument classes, gross positive and negative market values of those instruments, and aggregate exposures represented by derivatives portfolios before and after netting. By way of a summary, it identifies specific questions about macroeconomic and macroprudential aspects of the global financial system which the reporting framework should be able to answer.

1. The usefulness of derivatives market statistics for central banks and market participants

In most countries, central banks are charged with two principal tasks: maintaining the stability of prices and maintaining the integrity of the financial system. To perform these tasks, central banks regularly collect economic data from a wide variety of sources. Figures on assets and liabilities in the financial system are monitored especially closely. The ability of firms to assume and manage risks using derivatives markets has meant that many of the data central banks currently gather on their financial systems provide only a partial picture of the structure and functioning of those systems. Regular derivatives reporting is thus necessary to enable central banks to gain a more complete understanding of financial sector developments in both their national economies and the global economy.

The Hannoun Report discusses the many ways in which derivatives are thought to affect central banks' monetary policy formulation and implementation. It notes that derivatives can affect the environment in which monetary policy operates by changing the speed of market movements; that they can affect the monetary transmission mechanism by modifying the ways in which economic agents respond to interest and exchange rate adjustments; that they can affect the information content of traditional monetary policy indicators as well as providing new indicators; and that they can affect the use of existing monetary policy instruments. Regularly available information on the size and

structure of derivatives markets and the wealth transfers that take place through them could provide valuable information regarding the likely significance and direction of many of these effects.[11]

Regular reporting can also be used to track the evolution of derivatives markets in the context of other economic and financial developments. For example, the planned introduction of a single currency as part of European economic and monetary union (EMU) can be expected to have a significant impact on financial risks and derivatives-related hedging needs in European Union countries. The proposed regular derivatives reporting framework would provide information that could shed light on this process.

The timely dissemination of aggregate statistics should contribute to improving market functioning by enhancing the overall transparency of derivatives markets. As market participants make decisions about the adoption and trading of exposures to underlying risk factors, it is important for them to know the size of the markets for various instruments, so that they can assess market concentration and the relative size of their own activities. Inadequate information could lead to misjudgements in times of market stress. For example, a participant might rely on being able to hedge a position in a given market in stressful circumstances, without realising that the market is too thin relative to underlying risk exposures to support such extra activity.

2. Existing statistics and their shortcomings

The data available on OTC derivatives markets prior to the April 1995 survey, whether gathered by central banks or by market associations, were deficient in a number of respects. First, it was not possible to compile comprehensive data on the scale of global derivatives market activity, covering both banks and securities firms. Second, the available data were focused primarily on the notional amounts of contracts outstanding and were, as a result, relatively uninformative as to the size and distribution of the credit risks incurred in derivatives markets. Third, the data provided only limited information on the structure of participation in derivatives markets. Fourth, shifting reporting populations cast doubt on the comparability of some regularly published figures from one reporting period to the next. Finally, data on the concentration of market-making functions were not readily available. As a result of these limitations, the data did not lend themselves to assessing issues such as liquidity in derivatives markets or the nature of the market dynamics engendered by derivatives trading.

Some of the shortcomings of existing data were addressed by the 1995 survey. However, data from a triennial survey are not sufficient to track the development of derivatives markets, for a number of reasons. One is that they give a picture of the market which rapidly becomes outdated. Regular reporting would enable monitoring of the size and structure of global derivatives markets and their development over time. A second disadvantage of comprehensive market-wide surveys is that the reporting population is unlikely to be identical from one survey to another. A smaller reporting population allows comparability of successive figures. Third, if the reporting population is confined to large dealers, who are likely to have a greater understanding of the markets and better information systems, more confidence can be placed in data requiring a relatively high degree of sophistication on the part of the reporter, such as counterparty breakdowns and market value figures. Providing such figures may impose an excessive burden on smaller firms. Finally, having a well-defined, stable reporting population facilitates the elimination of double-counting. Contracts with other reporters can be more easily "flagged" in the reporting firms' records.

Taking into account the considerations identified above, the Working Group recommends limiting periodic reporting of derivatives data to a small group of institutions, approximately 80 in

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[11] As Part IV emphasises, however, such information must be interpreted with care and in the proper context. Derivatives data can only be enlightening about wealth or risk transfers if a time series is collected, as would be the case with regular reporting. Even then, profits and losses on these positions could be offset by positions in other types of securities and therefore might not affect wealth or risk as much as they would appear to do if examined in isolation.

number, serving as intermediaries in the main OTC derivatives markets. This population would be chosen with the aim of covering at least 90% of the notional amounts of all derivatives outstanding as of the April 1995 survey. Participation in the reporting exercise would ideally extend beyond the usual central bank reporting population to include banks, securities firms and in some countries possibly other financial institutions, such as large insurance companies. However, it would exclude smaller banks and securities dealers, unless these are members of larger groups that qualify as members of the reporting population on the basis of their consolidated global activities.

3. Appropriate components of regular derivatives market statistics

3.1 Notional amounts outstanding

The notional amount of a derivative contract is a reference figure used to calculate cash flows under the contract. In most cases, notional amounts permit a comparison of the market risk represented by the contract with that represented by a comparable cash market asset. A sum of notional amounts outstanding thus provides a rough approximation to the scale of gross exposures to price risk transferred between the contracting counterparties, just as adding the principal amounts of a group of cash market assets offers a picture of the price risk embedded in those assets. Because the actual price risk exposure incurred through a derivative depends on many things besides the notional amount, such as the maturity, the rates or prices underlying the contract, whether the position is long or short and, for option-like instruments, the degree to which the contract is in the money, a notional amount can offer only a very general guide to risk exposure. However, the ease of reporting notional amounts and the comparability of the notional amount concept across very different instruments makes it an appropriate "summary" statistic for tracking the size of the market for classes of derivative instruments.

Regularly available figures on notional amounts outstanding would permit central banks to monitor the scale of the gross transfer of market risk that has occurred through the use of specific classes of derivative instruments. When compared with outstanding principal amounts of comparable cash market instruments, they can assist monetary policy-making by indicating whether certain risks, some of which represent exposures to central bank policy decisions, have been transferred. Counterparty breakdowns can give a rough idea of the degree to which specific sectors are trading such exposures. A reporter/non-reporter breakdown is necessary to eliminate double-counting. Breakdowns of derivative contracts according to their remaining maturity offer more information about the significance of the risk transfers undertaken through derivatives: for example, the value of a six-year interest rate swap is likely to be more sensitive to a given change in the overall level of interest rates than that of a one-year swap.

Finally, regularly published data on notional amounts would enhance market transparency and permit firms to determine their share of overall market activity. This would make it less likely that any single firm would come to dominate a particular product class without this being recognised by the management of the firm itself.

3.2 Gross positive and negative market values

The gross market value of an outstanding contract shows the degree to which movements in the price underlying the contract have caused unrealised benefits or losses to the reporting firm since the contract's initiation. Aggregated gross market value is thus an approximate measure of the gross wealth transferred in financial markets in the recent past as a result of movements in the prices underlying a given class of derivative contracts. As such, it is particularly suited to regular reporting, as opposed to periodic surveys. A gross market value figure reported only once every three years could well reflect unusual recent price movements or market activity. In contrast, gross market values

reported every three or six months would give a running picture of the role played by derivatives in transferring wealth in different market environments.

The usefulness of gross market values for monetary policy complements that of notional amounts. The levels of and changes in aggregate gross market value figures - calculated by adding the gross positive market values of all reported trades to the gross negative market values of dealers' trades with customers (excluding intra-group transactions) - offer measures of the gross amount of wealth that has been transferred through derivatives markets in the recent past. Such transfers can be observed for the financial system overall or on a sectoral basis.

For the purposes of macroprudential policy, the gross positive and negative market values reported by dealers offer an indication of the gross credit exposures assumed respectively by dealers and end-users through OTC derivatives (though actual credit exposures are in practice reduced by netting and other arrangements). Viewed in isolation, an OTC derivative contract is an asset to the counterparty for which the contract has a positive market value, and a liability to the counterparty for which the market value is negative. Just as central banks have an interest in keeping track of the cash market assets and liabilities created by the financial system, it is useful for them to know the amount of positively valued and negatively valued commitments that intermediaries have acquired through their derivatives market activities. A comparison of gross positive and gross negative market value provides a rough indication of the extent to which dealer exposures to derivatives are balanced. Regular reporting permits the tracking of this balance over time. To enhance their usefulness, market value data would have to be broken down into the same categories as the corresponding notional amount data: by risk factor, instrument type and counterparty.

3.3 Credit exposure

As noted in the previous section, the gross positive market value of a portfolio of derivative contracts is not necessarily identical to the associated credit risk. This is because netting agreements, collateral and guarantees reduce credit exposure. Most central banks already monitor closely the aggregate amount of debt outstanding for different sectors in order to understand economic and financial developments. Central banks have an equivalent interest in keeping track of the aggregate sums of derivatives-related credit exposures. Since their interest is in the size and distribution over counterparty types of overall credit risk exposures, useful aggregate credit exposure data need not be broken down by instrument or by underlying risk factor.

B. A proposal for regular derivatives market reporting

1. The supervisors' common minimum information framework

In May 1995, the Basle Committee on Banking Supervision and the Technical Committee of the International Organization of Securities Commissions (IOSCO) jointly released a paper entitled "Framework for Supervisory Information about the Derivatives Activities of Banks and Securities Firms". This report contained a common minimum framework (CMF) of information which the Committees recommended that supervisors have available for evaluating the credit risks taken by supervised institutions through their derivatives activities. The CMF requests data for notional amounts outstanding, gross positive and negative market values, credit exposures and information on past-due OTC derivatives and derivatives-related credit losses. Overall totals are broken down according to market risk factors, maturity baskets and counterparty credit quality. At the time of writing, supervisors in most of the G-10 countries have undertaken to implement the CMF by no later than mid-1998. This information will be regularly reported in almost all countries, although in some cases firms will provide data in on-site inspections or make them available at supervisors' request.

The Working Group considered very carefully the supervisory minimum framework and concluded that aggregation of the information in the framework, if collected with sufficient timeliness and frequency, would in many respects satisfy the information requirements for market statistics set out in the Brockmeijer Report. In order for the framework to be used to this end, however, a means would have to be found to address the problem of double-counting that arises in statistical aggregation. In general, this requires the identification of contracts which are concluded between members of the reporting population and would thus be reported twice. The Group also felt that the general usefulness of aggregate statistics based on data from the CMF, in terms of central banks' information needs, would be materially enhanced if some further breakdowns, by type of counterparty and by currency, could be introduced within the broad market risk categories currently identified (i.e. interest rate, foreign exchange and equity risk).

Accordingly, the Group settled on an approach under which the members of the regular reporting population would be asked for more detailed counterparty and risk factor breakdowns of items already included in the CMF. The aim is to keep the reporting burden low by preserving as much consistency as possible between the CMF and the regular reporting exercise, while ensuring that the resulting data fulfil the monetary policy, macroprudential and transparency needs outlined above.[12]

2. The proposed regular reporting framework

This section describes the principal elements of the proposed reporting framework. Some of the contrasts between the framework and the April 1995 survey are listed in Table 8. The elements of the framework are presented in tabular form in Annex 2.

2.1 Choice of reporting firms

The total number of consolidated reporters worldwide would be approximately 80. The choice of reporting firms would be left to national discretion, though it is intended that the reporting population be chosen so that, taken together, the chosen institutions represent a large part of total global activity in each of the major categories of derivatives, and that reporters from each of the eleven G-10 countries be included. The reporting population would be kept constant over a period of several years, in order to make figures on the reporter/non-reporter breakdown comparable from one reporting period to the next and to reduce the need for burdensome adjustments in reporting firms' information systems.

Reporting would be on a consolidated basis. This means that data from all domestic and foreign branches and subsidiaries of a given institution would be added together and reported by the parent institution only to authorities in the country where the parent institution has its head office. Deals between affiliates of the same institution would not be reported.

Consolidated reporting has a number of advantages over the principle of reporting by location used in the April 1995 survey. First, it would enhance compatibility with the CMF, which is to be implemented on a consolidated basis. Second, it would make the task of collecting the data easier, particularly in the larger centres, because both the number of reporting firms and the number of participating centres would be reduced drastically. Third, it would make concentration ratios more meaningful. Location-based data, in contrast, besides lacking these advantages, can be misleading, as discussed above (see Section II.B.1.4).

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[12] As part of this approach, detailed definitions of items in the reporting framework would be aligned with the definitions employed in the CMF wherever possible.

Table 8

The April 1995 survey and the proposed reporting framework compared

	April 1995 central bank survey	**Proposed reporting framework**
Frequency	One-time (possible extension to triennial)	Semi-annual (possible extension to quarterly)
Reporting population	approx. 2400 banks, securities firms and affiliates in 26 centres	approx. 80 financial groups in 11 centres
Reporting basis	By location (reported to central bank where a trade takes place or is booked)	Consolidated (reported to central bank of the country where the group has its head office)
Currency breakdowns	FX turnover: 31 pairs/categories FX outstandings: 7 pairs/categories Interest rate turnover & outstandings: 4 currencies/categories Equity outstandings: 4 categories	FX and interest rate outstandings: 11 currencies, plus additional currencies if material Equity outstandings: 6 categories
Counterparty breakdowns	Reporter/non-reporter, financial/non-financial, local/cross-border	Reporter/non-reporter, financial/non-financial
Breakdowns of option contracts	Purchased/sold, on traded securities/others (OTC interest rate contracts only)	Purchased/sold
Outstandings data	FX, interest rate, equity and commodity contracts	FX, interest rate and equity contracts (as well as broad commodity contract data limited to those included in the CMF)
Turnover data	FX and interest rate contracts	Not collected
Credit exposure data	Not collected	Before and after netting

2.2 Frequency and timeliness

Initially, reporting would be on a semi-annual basis. Data would be reported within two months of the "as of" date. At the same date on which full consolidation is implemented, timeliness would be improved to one month. The possibility of a move to quarterly reporting at this date, or subsequently, would be left open.

2.3 Coverage

The reporting framework would collect data on derivative products according to the following classification (table references below relate to Annex 2):

- foreign exchange products (Tables 1A-C and Table 4, rows 1-5);
- single-currency interest rate products (Tables 2A-C and Table 4, rows 6-9);

- equity and commodity-linked products (Tables 3A-C and Table 4, rows 10-13). For commodity-linked products, only the overall totals included in the CMF would be requested.

For each product category (swaps, options, etc.) in each of these broad market risk classes, reporters would be asked to provide:

- amounts outstanding, measured by the notional (nominal) amount (Tables 1A, 2A, 3A and 4), of OTC and exchange-traded contracts. Only exchange-traded contracts on the reporter's own books (as opposed to those purchased and sold for customers) would be counted;
- gross positive market values of outstanding OTC contracts (Tables 1B, 2B and 3B);
- gross negative market values of outstanding OTC contracts (Tables 1C, 2C and 3C).

Amounts would be reported in US dollar equivalents.

The CMF requests that banks (but not securities firms) include gold contracts with foreign exchange contracts. However, the Working Group did not consider it warranted to gather detailed information on gold derivatives, in view of the small size of these markets. Accordingly, the counterparty, currency, and maturity breakdowns of foreign exchange contracts in Tables 1A-C and 4 would not be applied to gold contracts.

2.4 Counterparty breakdowns

For each product category in each of the three broad market risk classes, OTC contracts with reporting dealers, non-reporting financial institutions and non-financial customers would be reported separately. A list of reporting firms and their consolidated subsidiaries would be provided for this purpose. "Non-reporting financial institutions" could comprise banks, securities firms and such non-bank financial institutions as central banks consider appropriate for purposes of distinguishing between firms acting as intermediaries and end-users (e.g. mutual funds, pension funds, hedge funds, currency funds, money market funds, building societies, leasing companies, insurance companies and central banks).

2.5 Currency breakdowns

Figures for foreign exchange contracts would be broken down on a single-currency basis. This means that each contract would be reported twice, according to the currencies making up the two "legs" of the contract. The total of the amounts reported in columns 2-17 would thus be 200% of the total reported in the first column. For example, consider a bank which enters into a forward contract to purchase French francs in exchange for Deutsche Marks, with a notional principal of $100 million. The bank would report $100 million in the FRF column and $100 million in the DEM column.

A single-currency breakdown was chosen over a currency-pair breakdown for a number of reasons. First, as noted above (see Section II.B.2.3), it would conform to the structure of most reporters' existing risk management systems. Second, if at some future date there were interest in specific currencies not now included, the desired currencies could be added simply by inserting one or more columns, rather than by inserting the many additional columns needed to incorporate every newly relevant currency pair. Third, a breakdown by single currencies makes it easier to compare data collected on foreign exchange derivatives with data collected on single-currency interest rate derivatives. Finally, the loss of information that would result by not having currency pairs is not great, considering that the overwhelming majority (82%) of foreign exchange contracts reported in the survey had the US dollar on one "leg".

The list of currencies and currency groups shown in the foreign exchange and single-currency interest rate tables (1A-C, 2A-C) was chosen to balance central banks' interest in obtaining a

full picture of the relevant markets with the need to keep the reporting burden low. Most market participants told members of the Group that, if a currency breakdown were requested, the number of currencies would not in itself have any material relevance to the burdens imposed by the reporting exercise. Thus, it was decided to request information on each of the G-10 currencies. Upon the adoption of a single currency by countries participating in EMU, this list would be revised accordingly.

Participants would also be asked to identify amounts for additional currencies if they had a material amount of outstanding contracts in these currencies.[13] Each central bank would report the aggregate amount reported to it for each non-G-10 currency to the BIS. This would enable central banks to monitor the development of international markets for derivatives based on non-G-10 currencies.

2.6 Maturity breakdowns

Table 4 requests information on the remaining maturity of OTC derivatives broken down according to three risk factor categories (foreign exchange, single-currency interest rate and equity) and three product categories (forwards and swaps,[14] purchased options and written options). Notional amounts outstanding would be reported according to three maturity baskets.

2.7 Credit exposures and liabilities

Table 5 requests information on credit exposures and liabilities arising from OTC derivative contracts. For contracts which have a positive market value, institutions would be asked to report the gross market value of these contracts and the total value of credit exposures after taking account of netting agreements (first column). For contracts which have a negative market value, institutions would be asked to report the total market value of these contracts and the total value of liabilities after taking account of netting agreements (second column).[15]

2.8 Publication

Data would be reported to participating central banks and then sent, in aggregated form, to the BIS. Regulators represented on the Technical Committee of IOSCO would assist in obtaining data from firms which fall under their regulatory jurisdiction. The BIS would compute and publish the global totals. Each central bank would be committed to collect the data from at least three institutions. The purpose of this commitment is to preserve the confidentiality of firm-level data for national submissions to the BIS.

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[13] The use of a fixed number of blank columns in Tables 1A-C and 2A-C to indicate the reporting of these additional currencies is intended for expositional purposes only. The determination of a "material" amount for reporting a non-G-10 currency would be left to the discretion of each participating central bank.

[14] If it is found that it is not burdensome for banks to report the remaining maturities of outstanding FRAs separately from those of interest rate swaps, this may also be considered.

[15] It might reduce the reporting burden if, for the purposes of Table 5, the reporter/non-reporter breakdown for the commodities contract share of derivatives-related credit exposures were estimated or omitted, because such a breakdown is not requested elsewhere for such contracts. Considering the very small size of financial institutions' holdings in commodity derivatives markets relative to the other three categories (for which the reporter/non-reporter breakdown would be available), this would probably have very little effect on the accuracy of the resulting figures.

C. Summary and recommendations

1. Questions the proposed reporting framework should be able to address

It is expected that the following questions would be among those that could be addressed by the data from a regular derivatives market reporting framework:

- How large is the derivatives-created gross exposure to a change in a given interest or exchange rate relative to that created by the corresponding cash markets? (Use notional amounts.)
- How "developed" are the markets for financial instruments denominated in a given currency, relative to those denominated in other currencies? (Use notional amounts.)
- How liquid are the derivatives markets for particular instruments? (Use notional amounts.)
- To what extent are dealers as a group using derivatives to intermediate among end-users rather than to take positions themselves? (Use gross positive and negative market values.)
- How large are financial firms' derivatives-created credit exposures relative to their exposures deriving from conventional credit market activities? (Use credit exposures.)
- To what extent are firms' derivatives-related credit exposures covered by netting agreements? (Use credit exposures gross and net of netting agreements.)
- If large outstanding positions with non-linear return profiles are thought to increase the likelihood of sudden price movements, is there a possibility of such sudden price movements in a given market? (Use notional amounts of option-like products.)

It may take some time before these questions can be answered with confidence. Analysts would have to become sufficiently familiar with the "normal" levels and fluctuations of the reported aggregate variables to make hypotheses about the significance of new trends appearing in those levels from one reporting period to another.

2. Further considerations

Discussions with market participants revealed that institutions differ widely in their ability at present to implement the reporting framework. Some would be able to do so with only relatively minor adjustments to existing systems, whereas for others the necessary adjustments would represent a considerable burden. Some firms reported that, because of incompatible systems within the organisation, it would be difficult to compile the requested data for all of their subsidiaries, at least initially. Participants' views on reporting issues are discussed more extensively in Section II.B.2.

The Working Group recognised the need to keep the overall reporting burden low. At the same time, the Group noted that financial institutions are continuing to develop flexible, reliable, firm-wide information systems capable of keeping track of exposures to market risks, holdings of different kinds of derivative instruments and counterparty exposures on a consolidated basis. In the light of these considerations, the Group decided to recommend that the framework be implemented at the end of 1997, subject to the approval of the G-10 Governors. This should give participants time to modify their information systems as needed.

3. Recommendations

To summarise, the Working Group recommends the institution of regular reporting of data on firms' holdings of derivative instruments, according to the framework outlined in this section. The data would be reported on a consolidated basis to the central bank of the country where the reporting firm's head office is located. Each central bank would then aggregate these data and report the aggregated figures to the BIS, which would publish the globally aggregated figures in a timely manner. The target date for implementation of the framework would be the end of 1997. Reporting would be on a semi-annual basis. Data would be reported within two months of the "as of" date.

Timeliness would be improved to one month by a subsequent target date, ideally the end of 1999. The possibility of a move to quarterly reporting at this date, or subsequently, would be left open, and would partly depend on whether comparable supervisory reporting has moved to a quarterly basis.

IV. MEASURES OF AGGREGATE MARKET RISK

This section discusses some areas of research which, in the opinion of the Working Group, merit further exploration by central banks and others with an interest in developing a better understanding of aggregate financial market behaviour. The discussion is framed in terms of risk measurement techniques that might be appropriate for addressing the interests of central banks in this regard, in particular techniques that measure risk at the level of firms' overall portfolios rather than merely their derivatives holdings. The intention is primarily to set out these interests and suggest avenues for further research, rather than to put forward proposals for the actual implementation of any of the techniques presented.

1. Why measure aggregate market risk?

The previous section set out a framework for collecting historical market statistics covering global derivatives markets. Despite their usefulness in tracking changes in market structure over time, historical statistics confined to derivatives can shed only limited light on how market values might change in the face of shocks to market risk factors. The limitations of such data were recognised in the Brockmeijer Report.

Aggregate measures of market risk are likely to constitute a better basis for assessments of the exposures that market participants take to various risk factors, and are therefore necessary in order to place the derivatives data in context. Aggregate measures of market risk would be relevant for a range of issues, including:

- the transmission of shocks in market risk factors within a reporting dealer group and among sectors of the economy;
- the link between derivatives markets and cash markets, and the role of exchange-traded derivatives transactions in modifying exposures undertaken through OTC derivatives markets;
- the role of derivatives market transactions in modifying (offsetting or magnifying) exposures undertaken by dealers through on-balance-sheet transactions;
- the potential for positive feedback in the market for a risk factor or a cluster of risk factors, and the scale of any resulting addition to market demand relative to existing exposures.

Information on these issues would help to identify those market risk factors that do (and those that do not) have the potential to disrupt the financial system. The goal would not be to forecast events, but rather to quantify potential sources of systemic stress. Aggregation of these effects across firms might also provide statistics that would allow market participants to judge the reasonableness of their own risk management assumptions. However, it is recognised that, in some of the instances outlined above, quite detailed data would be required and considerable efforts would be needed to interpret them.

2. Availability of information on aggregate measures of market risk

The Brockmeijer Report recognised that a potentially fruitful approach for monitoring the market linkages and price dynamics engendered by trading activities could involve the use of data generated by firms' internal information systems. These systems are now routinely employed by some firms to compute summary statistics that are intended to assist the firm's management in assessing the potential losses represented by the firm's portfolio of risk positions. Perhaps the most well-known of such measures, value-at-risk (VaR), represents the loss that the firm expects to experience over a specified holding period (such as one day) with a specified probability (such as 5%). The risk positions included in such portfolios include those established in securities and other cash instruments, as well as in derivative contracts.

From the point of view of the risk manager of an individual firm, the use of simplified models based on the assumption that securities returns follow multivariate normal distributions may be adequate for managing short-term trading risks. However, there is compelling evidence that many of these data are drawn from empirical distributions with heavier tails. From the perspective of the market as a whole, the consequences of simplification are serious because of the need to concentrate on events which may have systemic implications. Concern about rare events is of prime concern to central banks in the context of their macroprudential policies.

The Working Group considered on an exploratory basis whether an aggregate measure of market risk could be constructed using simple summations of individual firms' VaR measures. It formed the view that such an aggregated measure would probably not be satisfactory as the overall summary measure of market risk, though it might have some value as an indicator of trends in risk exposures. One reason for the Working Group's judgement is the difficulty of interpreting an aggregate VaR measure across firms. This is because the VaR measures the likelihood of a given loss without reference to the direction of the change in the underlying risk factor. For example, with regard to interest rate risk, the event that figures most prominently in one firm's VaR might be a rise in interest rates, while another firm's position could be such that its VaR is driven by the possibility of a fall in interest rates. For purposes of assessing the direction of aggregate market risk exposure, the sum of the two firms' VaR measures would be meaningless.

3. Possible approaches

Preliminary work on approaches for measuring market risk was presented to the Working Group. A common feature of the approaches is that they define possible scenarios in terms of changes in market risk factors rather than as shocks measured in standard deviations. Measuring shocks as standard deviations is the most straightforward way for individual firms to conduct stress tests as part of their own risk management efforts. However, since firms do not use identical techniques to measure standard deviations, this method is unlikely to support meaningful aggregation.

Under one approach, reporting firms could report price sensitivity values (deltas, gammas, etc.) for their portfolios and information on portfolio composition. Changes in firms' portfolio values, given assumed price changes, could then be computed by the central bank collecting the data. Possible feedback trading effects could, in turn, be analysed using assumptions regarding the behavioural rules followed by firms' portfolio managers. For example, it might be assumed that all portfolio managers seek to move to a position in which they are hedged against further price changes (a delta-neutral position) or, alternatively, that managers seek to re-establish delta values in the aftermath of a price shock.

As part of a stress testing exercise, two types of scenarios could be used:

- scenarios based on historical covariation of market risk factors, and
- scenarios not based on historical covariation of market risk factors.

Scenarios based on historical covariation permit the capture of extreme but empirically realistic conditions. These scenarios can be efficiently set out by data-driven methods, such as principal components analysis. On the other hand, for some market risk factors, history may be a quite unreliable guide. In such cases, scenarios could be constructed so as to avoid overlooking potentially stressful events. Thus, because many market participants' hedging strategies might have been guided by historical relationships among market risk factors, the shocks that create the most stress would be atypical shocks. Option prices can be used to estimate distributions of market participants' perceptions of the distribution of asset prices and, as a result, identify the probability of large price moves. It might also be worthwhile to collect information on market liquidity, which would assist central banks in assessing the risk profiles of markets under stress. A stress testing exercise formulated using these principles could shed light on the potential significance of the realisation of an event (such as a significant bond or equity market correction) in terms of the magnitude and distribution of contractual wealth transfers that would occur in its aftermath.

A central issue is the accuracy of the price sensitivity approximations for scenarios with large price changes. Firms could be asked to report the change in portfolio value with respect to a small change in each risk factor and again for a large change in each risk factor. This alternative would give exact changes in value for the specified price changes, and allow interpolation for changes in prices of different size. Whether this approach provides a more accurate approximation for large price changes than the use of price sensitivity values is an open question.

An important early step in carrying forward work in these areas would be to consider how much information is or will be available from other sources, such as the market risk returns from the Capital Adequacy Directive in European Union countries or from the implementation of the Basle Committee's market risk framework. This would make clearer what gaps there are and point to difficulties in interpretation.

An alternative method of monitoring aggregate market risk would be for firms to sort their portfolios into long positions and short positions with respect to market risk factors. An advantage of this method is its simplicity. A disadvantage lies in its inability to reveal the differential effects on portfolio values of various positions. For example, this approach would not differentiate between a deep out-of-the-money option and an at-the-money option.

4. Information issues

The implementation of forward-looking monitoring of aggregate market risk could be a costly undertaking and raises a number of as yet unresolved issues. One open question with respect to all of these approaches is whether market participants, at least at present, will be willing to reveal data that could indicate their price sensitivities.

A second is that many large financial institutions still do not have the information systems needed to support reporting of aggregate measures of market risk sensitivity. Nevertheless, some large firms, motivated by business needs, have constructed flexible information systems, and over the medium term most other firms can probably be expected to upgrade their capabilities to meet the new market standards for information systems so as to conduct risk management in a more informed and disciplined manner. This process has been reinforced by the emphasis placed by banking supervisors on the quality of banks' internal risk management systems. The Working Group considers it likely that, by the turn of the century, the major dealing firms in global risk-trading markets will have systems capable of supporting this kind of reporting at modest cost. If such systems are to be put in place in any case, an awareness of central bank interest in data on aggregate market risk may help firms to take this possible use into account in designing their systems.

5. Recommendations

The Working Group suggests that central banks initiate a process to consider whether there is a case for the capturing of aggregate market risk. Some preliminary work could be carried out to identify what the uses of aggregate market risk data would be and what data would be required. The Group recognises that the market would expect a clear justification for any further statistical demands. This justification would have to centre on the policy uses of such information.

The process should involve a continuing dialogue, beginning with a general discussion with probable reporters and with supervisors. Central banks could contribute to this dialogue through the promotion of research efforts of the type presented at the conference on "Risk Measurement and Systemic Risk" held in Washington in November 1995 and organised jointly by the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of New York, the Bank of England, the Bank of Japan and the BIS. The dialogue could be usefully furthered through the issuance of a discussion paper by the Euro-currency Standing Committee, which would present the results of central bank research efforts concerning techniques for aggregate market risk reporting.

ANNEX 1

OVERVIEW OF SURVEY RESULTS

1. General overview

Table A.1 provides a global overview of outstanding notional amounts by risk category.[16] Taking outstanding notional amounts as a yardstick for market size, the table shows that interest rate derivatives markets are by far the largest category, both on over-the-counter (OTC) markets and on exchanges. The equity derivatives markets are far smaller than either of these, while the commodity derivatives markets seem to be the smallest, though the amount of business being transacted in both cases may be somewhat larger than reported because the survey was not completed by many of the participants in these markets.

Table A.1

Outstanding notional amounts

(at 31st March 1995, in billions of US dollars)

FX derivatives	
OTC	13,095
Exchange-traded	120
Interest rate derivatives	
OTC	26,645
Exchange-traded	15,669
Equity derivatives	
OTC	579
Exchange-traded	442
Commodity derivatives	
OTC	318
Exchange-traded	142

Exchange-traded figures are not corrected for double-counting. In addition, as noted in Section II.A.2 of the present report, is not clear that exchange-traded activity was covered to the same degree in each reporting centre. Direct comparisons between OTC and exchange-traded figures should therefore only be made with caution. Bearing this in mind, one can nevertheless note from the table that the foreign exchange (FX) derivatives market is primarily an over-the-counter market. In the other three market segments, in contrast, exchange-traded and OTC activity would seem to be on roughly similar scales.

Table A.2 presents daily turnover statistics for FX and interest rate derivatives. These figures present a quite different picture from that offered by the notional amounts: turnover of OTC interest rate derivatives is smaller than that of OTC FX contracts, and is only a small fraction of turnover of exchange-traded interest rate derivatives. The fact that they exhibit a higher turnover and a lower amount outstanding suggests that OTC FX contracts are characterised by a shorter maturity than OTC interest rate contracts.

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[16] In this table, and in the others referred to in this Annex, figures are not adjusted for gaps in reporting. OTC figures are net of both local and cross-border double-counting.

Table A.2

Average daily turnover in notional amounts

(April 1995, in billions of US dollars)

FX derivatives	
OTC	688
Exchange-traded	15
Interest rate derivatives	
OTC	151
Exchange-traded	1,126

The fact that the outstanding amount of OTC interest rate derivatives seems to be higher than that of exchange-traded interest rate derivatives (though, as noted above, this is only suggested by the survey figures rather than established by them) may also reflect the fact that a portion of the reported outstanding OTC amount consists of offsetting positions. On exchanges, a participant closes out a position by liquidating the contract, while for OTC products the firm is more likely to exit its position by entering into an offsetting contract. Another explanatory factor could be the longer average maturity of OTC interest rate contracts relative to exchange-traded interest rate contracts.

2. Foreign exchange derivatives

Table A.3 provides an overview of turnover and outstanding amounts for FX derivatives, broken down by instrument.[17] FX swaps are the largest FX product category, in terms of both turnover and notional amount outstanding. Turnover in OTC FX products is several times larger than the turnover of corresponding exchange-traded products.

Table A.3

Turnover and outstanding amounts of FX derivatives by instrument and FX spot turnover

(April 1995 and 31st March 1995, in billions of US dollars)

	Average daily turnover	**Amounts outstanding**
OTC		
Outright forwards	97	} 8,699
FX swaps	546	
Currency swaps	4	1,957
Options	41	2,379
Other	1	61
Exchange-traded		
Futures	13	39
Options	3	81
Spot	494	

[17] Since in one important reporting centre outstanding amounts for FX forwards and FX swaps were not reported, the data on these instruments are not totally representative.

The currency swaps segment is characterised by relatively low turnover relative to the notional amount outstanding. This indicates both that currency swaps have a longer maturity than other FX instruments and that they are less frequently traded, probably because such swaps tend to be linked to specific on-balance-sheet liabilities.

Traditional FX products, i.e. forwards and FX swaps, still account for the bulk of turnover in FX derivatives markets. The less traditional FX products, i.e. currency swaps and currency options, account for only a small share of turnover, though they are relatively more prominent in terms of amounts outstanding.

Table A.4 presents the currency breakdown of FX derivatives turnover in percentage terms. As can be seen from this table, the US dollar is by far the most frequently used currency in FX derivative contracts. The largest product category, the FX swaps segment, is dominated by the dollar, which is involved in 95% of turnover. For the other OTC derivative products, the percentage is somewhat lower. The dollar is relatively more frequently used as a base currency in swap and forward products than one would expect given its share of turnover in spot markets. This partly reflects its use as a "conduit currency": transactions involving two non-dollar currencies are frequently structured through the use of two simultaneous contracts in which the dollar is a base currency, in order to enhance liquidity.

Table A.4

Currency breakdown of turnover of FX derivatives and spot transactions

(April 1995, in percentages)

	USD	DEM	JPY	GBP	FRF
Outright forwards	79	31	29	10	7
FX swaps	95	21	25	9	8
Currency swaps	83	15	30	4	7
Options sold	78	44	39	7	9
Options bought	75	46	37	7	10
Other OTC products	63	19	7	3	12
Futures	98	23	31	3	1
Exchange-traded options	98	48	32	7	2
Spot	71	54	22	9	8

For spot, forward and swap transactions, the three major currencies represent more or less the same share of turnover, about 70% in each case.[18] However, for OTC options, these three currencies represent about 80% of turnover. In other words, OTC option activity tends to be relatively more concentrated in exchange rates involving at least one of these three currencies. Similarly, the currency pair breakdown of turnover given in Table A.5 shows that OTC option activity is far more concentrated in the pairings of these currencies than is the case for other OTC FX products. For OTC options, the USD/JPY segment accounts for one-third of the market, the USD/DEM segment for one-quarter, and DEM/JPY for 5%. Table A.5 also shows that, while in the spot market the USD/DEM is undoubtedly the leading pair, the most commonly used pair in most derivatives categories is the USD/JPY.[19]

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[18] Since in Table A.4 each FX deal is accounted for twice, one obtains a group of currencies' percentage of the market as a whole by adding the currency percentage shares given in the table and dividing by two.

[19] Some market participants reported that FX options activity in April 1995 was skewed towards yen contracts because of the unusually sharp rise of the yen against most other currencies in the immediately preceding period.

Table A.5

Currency pair breakdown of turnover of FX derivatives and spot transactions

(April 1995, in percentages)

	USD/DEM	USD/JPY	DEM/JPY
Outright forwards	19	22	3
FX Swaps	17	24	0
Currency swaps	7	25	2
OTC options	25	33	5
Other OTC products	4	5	-
Futures	27	37	0
Exchange-traded options	46	32	1
Spot	29	18	4

Table A.6 presents the counterparty breakdown of OTC FX derivatives and spot turnover. It can be seen that inter-dealer activity is significantly larger for swap and option instruments than for outright forward transactions. More than two-thirds of foreign exchange swaps turnover is inter-dealer business. These figures demonstrate the importance of inter-dealer activity for market liquidity in those segments.

The table also shows a certain amount of market segmentation, even among the three very rough counterparty categories: dealers dominate the FX and currency swap markets, options are relatively more popular among financial end-users, and non financial customers are the largest users of forwards.

Table A.6

Counterparty breakdown of turnover of OTC FX derivatives and spot transactions

(April 1995, as a percentage of total turnover for each instrument)

	Outright forwards	FX swaps	Currency swaps	Options sold	Options bought	Other OTC products	Spot
With other dealers	34	68	62	51	49	17	66
With other financial institutions	29	20	16	32	33	44	19
With non-financial customers	37	12	22	17	18	39	15

Table A.7 shows outstanding market values for FX derivatives. If one adds gross positive and gross negative market values (correcting for double-counting, i.e. counting only the positive market values of inter-dealer exposures), one can gain a rough idea of the size of the risk transfers that are achieved by derivatives, though because they include inter-affiliate transactions one should approach such figures with caution. There is a rather wide variation between the instruments: for FX options, market value is only 3% of the notional amount outstanding, while this fraction rises to 18% for currency swaps. The high market value ratio for currency swaps probably reflects their relatively long duration and the exchange of principal at maturity.

Table A.7

Outstanding market values of FX derivatives

(at 31st March 1995, in billions of US dollars)

	Gross positive	Gross negative	Gross market value*	Gross market value as % of notional amount outstanding
Outright forwards and FX swaps	507	532	622	7
Currency swaps	234	238	346	18
OTC options	49	52	71	3
Other products	5	6	10	16

* Gross positive + gross negative, corrected for inter-dealer double-counting.

3. Interest rate derivatives

Table A.8 presents turnover and notional amounts of interest rate derivatives broken down by instrument. This table demonstrates that the large total notional amount of OTC interest rate products recorded in Table A.1 was mostly attributable to the interest rate swap segment, which accounts for 69% of all OTC interest rate derivatives outstanding.

In the OTC markets, the most frequently traded instruments are forward rate agreements (FRAs) and swaps. Their turnover is more or less of the same magnitude, but the outstanding amount of FRAs is much smaller than that of swaps, reflecting the shorter maturity of FRAs. Similarly, though the turnover of options on traded securities is more or less the same as that of other options, the outstanding amount of other options is much larger than that of options on traded securities. This is explained by the fact that options on traded securities tend generally to have a much shorter maturity than other options.

Table A.8

Instrument breakdown of turnover and outstanding amounts of interest rate derivatives

(April 1995 and 31st March 1995, in billions of US dollars)

	Turnover	Outstanding amounts
OTC		
FRAs	66	4,597
Swaps	63	18,283
Options on traded securities	10	430
Other options	11	3,118
Other	2	216
Exchange-traded		
Futures on interest rates up to 1 year	812	9,990
Futures on interest rates over 1 year	185	2,441
Options	128	3,238

The currency breakdown of turnover and outstanding amounts of interest rate derivatives can be found in Tables A.9 and A.10. In terms of total turnover on OTC markets (Table A.9), the US dollar is the most commonly used currency. However, on an instrument-by-instrument basis, the dollar holds this position only for the FRA segment and for "other options", the Japanese yen being the most important currency for swaps and options on traded securities. As regards notional amounts outstanding (Table A.10), the dollar is not only the largest currency in terms of the overall total, but also for each instrument. However, in neither case is its share as large as it is for FX instruments.

Table A.9

Currency breakdown of turnover of interest rate derivatives

(April 1995, in billions of US dollars)

	USD	DEM	JPY	Other
OTC	41	18	35	58
FRAs	18	9	10	30
Swaps	17	7	17	22
Options on traded securities	2	1	6	2
Other options	5	1	2	2
Other	0.4	1	0.1	1
Exchange-traded	295	119	476	236
Futures on interest rates up to 1 year	193	78	383	157
Futures on interest rates over 1 year	37	28	82	38
Options	65	12	11	41

Table A.10

Currency breakdown of outstanding amounts of interest rate derivatives

(at 31st March 1995, in billions of US dollars)

	USD	DEM	JPY	Other
OTC	9,307	3,376	5,562	8,400
FRAs	1,301	742	502	2,053
Swaps	6,088	2,077	4,591	5,527
Options on traded securities	146	90	67	128
Other options	1,682	454	340	643
Other	90	13	63	50
Exchange-traded	7,702	1,548	3,748	2,671
Futures on interest rates up to 1 year	4,244	1,031	2,963	1,575
Futures on interest rates over 1 year	1,385	225	440	386
Options	1,961	278	291	707

Table A.9 suggests that, at least among reporters, turnover of exchange-traded interest rate derivatives is dominated by the yen. This is entirely due to the yen futures category. The turnover in yen futures on interest rates up to one year is more than ten times the turnover of all OTC yen derivatives, and almost twice as large as turnover in short-term US dollar interest rate futures. With respect to the turnover of exchange-traded interest rate options, and with respect to outstanding amounts of all categories of exchange-traded instruments, however, the dollar is far more widely used than the yen.

Table A.11 provides data on the cross-border share of turnover of OTC interest rate derivatives. It can be seen from this table that the cross-border share varies widely across instruments and currencies. Looking at totals by instrument, the cross-border share is highest for the FRA segment (58% in total), and the lowest for other options (38%). Looking at currencies, interest rate derivatives in yen have the highest cross-border share, 69%, though the Deutsche Mark figure is virtually identical at 66%. These figures cast light on the relatively high use of the Deutsche Mark and the yen as numeraire currencies in interest rate contracts concluded outside their home countries. The "other currency" category has low figures for cross-border shares relative to the shares of the dollar, Deutsche Mark and yen, with an overall level of 39%. This points to the fact that few currencies challenge the status of the three major currencies in terms of their use in cross-border contracts.

Table A.11

Cross-border share of turnover of OTC interest rate derivatives

(April 1995, as a percentage of total turnover)

	Total	**USD**	**DEM**	**JPY**	**Other**
FRAs	58	62	71	78	46
Swaps	48	46	60	67	31
Options on traded securities	54	35	57	62	39
Other options	38	23	64	60	33
Other products	41	18	79	24	30
Total	**52**	**49**	**66**	**69**	**39**

Table A.12 provides a counterparty breakdown of turnover of each category of OTC interest rate derivatives. The figures for inter-dealer transactions demonstrate once again the importance of the inter-dealer segment for market liquidity. In most instrument categories, inter-dealer transactions are a smaller percentage of the total for US dollar contracts than they are for contracts in other currencies. This could be due to the fact that, since most of these markets originated in the United States, US end-users are relatively better acquainted with these products and hence more active in these markets.

Gross market values for interest rate derivatives can be found in Table A.13. Swaps are by far the most important instrument category, representing 87% of aggregate market value. In general, the ratio of gross market value to notional amount was quite low, and significantly lower than the ratios displayed by FX derivatives.[20] The very low figure for FRAs, 0.4%, reflects their relatively short duration.

[20] This ratio depends of course on the evolution of market risk factors, and is therefore a function of the specific market conditions at 31st March 1995.

Table A.12

Counterparty breakdown of turnover of OTC interest rate derivatives

(April 1995, in percentages)

	Total	USD	DEM	JPY	Other
Forward rate agreements					
with other dealers	74	68	71	75	77
with other financial institutions	20	26	24	24	14
with non-financial customers	6	6	6	1	9
Swaps					
with other dealers	66	59	65	78	61
with other financial institutions	22	31	28	10	23
with non-financial customers	12	9	7	11	16
Options on traded securities					
with other dealers	62	36	71	75	38
with other financial institutions	24	53	17	12	36
with non-financial customers	15	11	12	13	26
Other options					
with other dealers	47	34	72	59	50
with other financial institutions	20	29	17	9	14
with non-financial customers	33	37	10	32	36
Other products					
with other dealers	50	30	16	29	76
with other financial institutions	18	40	1	3	20
with non-financial customers	32	30	83	68	4

Table A.13

Outstanding market values of interest rate derivatives

(at 31st March 1995, in billions of US dollars)

	Gross positive	Gross negative	Gross market value*	Gross market value as % of notional amount outstanding
FRAs	17	13	18	0.4
Swaps	438	421	563	3.1
Options on traded securities	6	6	8	1.8
Other options	38	36	52	1.7
Other products	5	4	7	3.4

* Gross positive + gross negative, corrected for inter-dealer double-counting.

4. Equity derivatives

In equity derivatives markets, options seem to be the dominant instrument, both on exchanges and in OTC markets (Table A.14). The limited outstanding amount of OTC forwards and swaps may suggest that swaps based on a combination of equity and other risk factors (e.g. interest rates), which the survey instructions specified should be reported as equity swaps, are also rather limited. However, it is also possible that, as with commodities, the survey population excluded some of the important participants in equity derivatives markets.

The underlying market breakdown of equity instruments (Table A.15) shows that more OTC equity instrument activity is based on European equities than on US and Japanese equities combined. Japanese equity markets, however, are the largest providers of underlying factors for exchange-traded equity instruments.

Table A.14

Instrument breakdown of outstanding amounts of equity derivatives

(at 31st March 1995, in billions of US dollars)

Forwards and swaps	52
OTC options	527
Futures	154
Exchange-traded options	288

Table A.15

Underlying market breakdown of equity derivative instruments

(at 31st March 1995, as a percentage of total amounts outstanding for each instrument)

	US	**Japan**	**Europe**	**Other**
Forward and swaps	30	38	23	9
OTC options	20	15	51	13
Total OTC products	**21**	**17**	**48**	**13**
Futures	29	39	25	7
Exchange-traded options	30	37	23	9
Total exchange-traded products	**30**	**38**	**24**	**9**

ANNEX 2

THE REPORTING FRAMEWORK IN TABULAR FORMAT

Table 1A: Foreign exchange and gold contracts (notional amounts)

	Total FX contracts	of which contracts involving the following currencies (on one side):											Additional currencies in which the reporter has a material amount of contracts outstanding					Total FX contracts including gold
		USD	JPY	DEM	GBP	FRF	CHF	CAD	ITL	SEK	NLG	BEF						
OTC contracts																		
Forwards and FX swaps																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Currency swaps																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Purchased options																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Written options																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Exch.-traded contracts																		
Futures--long positions																		
Futures--short positions																		
Purchased options																		
Written options																		

Note: Boxes in double outline represent items requested in the Basle Committee/IOSCO common minimum framework (CMF).

Table 1B: Foreign exchange and gold contracts (gross positive market value)

	Total FX contracts	of which, contracts involving the following currencies (on one side):											Additional currencies in which the reporter has a material amount of contracts outstanding					Total FX contracts including gold
		USD	JPY	DEM	GBP	FRF	CHF	CAD	ITL	SEK	NLG	BEF						
OTC contracts																		
Forwards and FX swaps																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Currency swaps																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Purchased options																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Written options																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		

Note: Boxes in double outline represent items requested in the Basle Committee/IOSCO common minimum framework (CMF).

Table 1C: Foreign exchange and gold contracts (gross negative market value)

	Total FX contracts	of which, contracts involving the following currencies (on one side):											Additional currencies in which the reporter has a material amount of contracts outstanding					Total FX contracts including gold
		USD	JPY	DEM	GBP	FRF	CHF	CAD	ITL	SEK	NLG	BEF						
OTC contracts																		
Forwards and FX swaps																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Currency swaps																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Purchased options																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		
Written options																		
with: reporting dealers																		
non-reporting fin. insts.																		
non-financial customers																		

Note: Boxes in double outline represent items requested in the Basle Committee/IOSCO common minimum framework (CMF).

Table 2A: Single-currency interest rate contracts (notional amounts)

	Total interest rate contracts	of which contracts involving interest rates in the following currencies:											Additional currencies in which the reporter has a material amount of contracts outstanding				
		USD	JPY	DEM	GBP	FRF	CHF	CAD	ITL	SEK	NLG	BEF					
OTC contracts																	
Forward rate agreements																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Single-currency interest rate swaps																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Purchased options																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Written options																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Exch.-traded contracts																	
Futures--long positions																	
Futures--short positions																	
Purchased options																	
Written options																	

Note: Boxes in double outline represent items requested in the CMF.

Table 2B: Single-currency interest rate contracts (gross positive market values)

	Total interest rate contracts	of which contracts involving interest rates in the following currencies:											Additional currencies in which the reporter has a material amount of contracts outstanding				
		USD	JPY	DEM	GBP	FRF	CHF	CAD	ITL	SEK	NLG	BEF					
OTC contracts																	
Forward rate agreements																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Single-currency interest rate swaps																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Purchased options																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Written options																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	

Notes: Boxes in double outline represent items requested in the CMF.

Table 2C: Single-currency interest rate contracts (gross negative market values)

	Total interest rate contracts	of which contracts involving interest rates in the following currencies:															
													Additional currencies in which the reporter has a material amount of contracts outstanding				
		USD	JPY	DEM	GBP	FRF	CHF	CAD	ITL	SEK	NLG	BEF					
OTC contracts																	
Forward rate agreements																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Single-currency interest rate swaps																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Purchased options																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	
Written options																	
with: reporting dealers																	
non-reporting fin. insts.																	
non-financial customers																	

Notes: Boxes in double outline represent items requested in the CMF.

Table 3A: Equity and commodity-linked contracts (notional amounts)

	Total equity-linked contracts	of which contracts involving equity markets in the following countries or groups of countries:						Precious metals (other than gold)	Other commod-ities
		US	Japan	European industrial countries (see below)	Latin America	Other Asian countries	Other		
OTC contracts									
Forwards and swaps									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Purchased options									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Written options									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Exch.-traded contracts									
Futures--long positions									
Futures--short positions									
Purchased options									
Written options									

Notes: Boxes in double outline represent items requested in the CMF.
"European industrial countries" are: EU member states, Norway and Switzerland.

Table 3B: Equity and commodity-linked contracts (gross positive market values)

	Total equity-linked contracts	of which contracts involving equity markets in the following countries or groups of countries:						Precious metals (other than gold)	Other commod-ities
		US	Japan	European industrial countries (see below)	Latin America	Other Asian countries	Other		
OTC contracts									
Forwards and swaps									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Purchased options									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Written options									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									

Notes: Boxes in double outline represent items requested in the CMF.

"European industrial countries" are: EU member states, Norway and Switzerland.

Table 3C: Equity and commodity-linked contracts (gross negative market values)

	Total equity-linked contracts	of which contracts involving equity markets in the following countries or groups of countries:						Precious metals (other than gold)	Other commod-ities
		US	Japan	European industrial countries (see below)	Latin America	Other Asian countries	Other		
OTC contracts									
Forwards and swaps									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Purchased options									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									
Written options									
with: reporting dealers									
non-reporting fin. insts.									
non-financial customers									

Notes: Boxes in double outline represent items requested in the CMF.

"European industrial countries" are: EU member states, Norway and Switzerland.

Table 4: OTC derivative contracts by remaining maturity (notional amounts)

	Forwards and swaps			Purchased options			Written options			Total		
	One year or less	Over one year, up to five years	Over five years	One year or less	Over one year, up to five years	Over five years	One year or less	Over one year, up to five years	Over five years	One year or less	Over one year, up to five years	Over five years
Foreign exchange and gold contracts												
Foreign exchange contracts												
with: reporting dealers												
non-reporting fin. insts.												
non-financial customers												
Interest rate contracts												
with: reporting dealers												
non-reporting fin. insts.												
non-financial customers												
Equity-linked contracts												
with: reporting dealers												
non-reporting fin. insts.												
non-financial customers												

Note: Boxes in double outline represent items requested in the CMF.

Table 5: Credit exposure and liabilities arising from OTC derivative contracts

	Credit exposure	Liabilities
Gross positive/negative market value		
of which: with reporting dealers		
Market value after netting agreements		
of which: with reporting dealers		

Note: Boxes in double outline represent items requested in the CMF.