

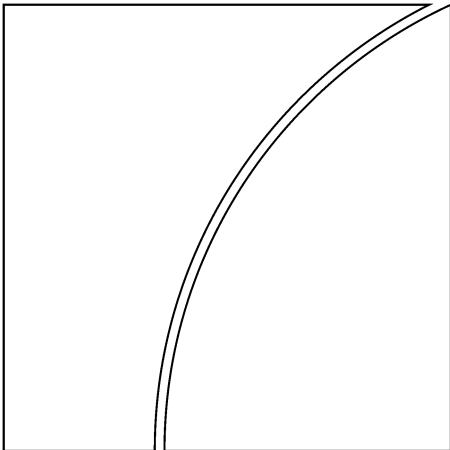


BANK FOR INTERNATIONAL SETTLEMENTS

Triennial Central Bank Survey

March 2002

Foreign exchange and
derivatives market activity
in 2001



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List of participating official monetary institutions

The following is a list of the official monetary institutions which provided national foreign exchange and derivatives market data, and to which requests for additional copies of this report should be addressed. Queries about the data may also be made to the BIS. The fax number is prefaced by the relevant country and area codes.

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A. Summary of main findings¹

In April and June 2001, 48 central banks and monetary authorities participated in the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity.² They collected data for April 2001 on turnover in traditional foreign exchange markets – those for spot transactions, outright forwards and foreign exchange swaps – and in over-the-counter (OTC) currency and interest rate derivatives. Preliminary results on turnover were published in October 2001. The survey also covered data on amounts outstanding of OTC foreign exchange, interest rate, equity, commodity and credit derivatives. These data were collected at end-June 2001 and preliminary results were published in December 2001. This was the fifth global survey since April 1989 of foreign exchange market activity and the third survey since March/April 1995 covering also OTC derivatives market activity. This report summarises the final global results on foreign exchange market turnover and the final statistics on OTC derivatives market turnover and amounts outstanding.

1. Foreign exchange market turnover

The April 2001 data on turnover in traditional foreign exchange markets show that several important changes have occurred in these markets since the last survey was conducted in April 1998.

Turnover in traditional foreign exchange markets declined substantially between 1998 and 2001. In April 2001, average daily turnover was \$1,200 billion, compared to \$1,490 billion in April 1998, a 19% decline at current exchange rates and a 14% fall when volumes are measured at constant exchange rates (Table B.1).³ The decline in turnover over the last three years contrasts with the findings of previous surveys, which had reported a rapid rise in foreign exchange market activity.

¹ Paola Gallardo, Blaise Gadanecz, Denis Pêtre and Karsten Von Kleist provided excellent research assistance.

² The geographical coverage of the survey has been progressively expanded, from 21 countries in 1989 to 26 countries in 1992 and 1995, 43 countries in 1998, and 48 in the latest survey.

³ The evaluation at constant exchange rates removes the impact of exchange rate changes from the changes in nominal trading volumes. A more detailed explanation of the computation of turnover at constant exchange rates is given in Section D.13 below.

Turnover did not decline uniformly across instruments. Trading volumes fell sharply in spot markets and, to a lesser extent, foreign exchange swaps (Graph B.1). By contrast, trading in outright forwards increased slightly.

The April 2001 figures also reveal some changes in the relative importance of trading between different counterparties. Trading between reporting dealers fell substantially, and its share in total turnover dropped from 64% in 1998 to 59% in April 2001 (Graph B.3). This can in part be explained by the growing role of electronic brokers in the spot interbank market, since the use of electronic brokers tends to reduce the need for foreign exchange dealers to trade actively among themselves.⁴ Another factor seems to be the decrease in risk tolerance that followed the financial market turbulence in the autumn of 1998.

Trading between banks and non-financial customers also declined markedly, possibly as a result of an acceleration of the consolidation in the non-financial corporate sector, and its share fell from 17% to 13%. By contrast, transactions between banks and financial customers increased and their share in total turnover rose from 20% to 28%. The higher activity between these counterparties seems to reflect the increasing role of asset managers. Market commentary suggests that the role of hedge funds in foreign exchange markets has on balance declined somewhat since the previous survey.

The introduction of the euro appears to have reduced turnover mainly through the elimination of intra-EMS trading. The euro entered on one side of 38% of all foreign exchange transactions – higher than the Deutsche mark's share in 1998 but lower than that of all euro constituents taken together in 1998 (Table B.4). The relative importance of other currencies seems not to have changed substantially since 1998. The shares of the dollar and the yen edged up to 90% and 23%, respectively. Dollar/euro was by far the most traded currency pair in 2001 and captured 30% of global turnover, followed by dollar/yen with 20% and dollar/sterling with 11% (Table B.6). Trading in emerging market currencies captured about 5% of foreign exchange activity in 2001, compared with 3% in 1998.

Finally, the data for 2001 reveal an overall decline in the number of reporting banks. This is consistent with the broad trend towards consolidation in the banking industry and the consequent reduction in the number of trading desks (Table B.5). This trend seems to have been an additional factor contributing to the decline in foreign exchange market turnover, especially in the interbank market.

For its part, the geographical distribution of foreign exchange trading appears not to have changed substantially over the last three years. Turnover fell in most countries, with some notable exceptions (Table B.7). In Japan, turnover increased mainly because of a surge in cross-border foreign exchange swaps. In Sweden and Canada, a relaxation of restrictions on institutional investors boosted foreign exchange market activity. In Australia, activity rose

⁴ See Gabriele Galati, "Why has global FX turnover declined? Explaining the 2001 triennial survey", BIS Quarterly Review, December 2001.

as a number of global players have centred their Asian time zone foreign exchange business in Australia.

2. OTC derivatives market activity

2.1 *Turnover data*

Global daily turnover in foreign exchange and interest rate derivatives contracts, including what are considered to be “traditional” foreign exchange derivatives instruments, increased by an estimated 10% to \$1.4 trillion between April 1998 and April 2001 (Table C.1). This represented a significant slowdown in market expansion relative to the period 1995-98, when daily business had expanded by 44%.

This slowdown masked a divergence in the evolution of the two largest market segments, with business in foreign exchange products declining by 12% and that in interest rate instruments rising by 86%. The downturn in foreign exchange products was consistent with lower turnover in the spot market for foreign exchange, a market segment that has experienced substantial structural change in recent years. In that context, a particularly significant factor has been the introduction of the euro, which led to a sharp contraction of trading in contracts involving euro zone currencies. By contrast, the strong expansion of activity in interest rate products was largely driven by the buoyancy of the interest rate swap market. This buoyancy reflected a broad shift in hedging and trading practices in US fixed income markets and the creation of a large and liquid market in euro-denominated interest rate swaps.

Despite the contraction observed in foreign exchange products, turnover in that market segment continues to be substantially higher than that for interest rate products, owing largely to the shorter maturity of the first group of contracts. However, if interest rate business continues to expand as rapidly as it has done over the past few years, it could eventually catch up with that in foreign exchange products (Table C.2).

The data on turnover also showed a major difference in the evolution of counterparty business between the two main groups of products (Table C.1). In the area of foreign exchange derivatives, business within the group of reporting dealers declined by 18%. This decline may have been related to the broad factors affecting the spot market. In the area of interest rate products, by contrast, business within the group of reporting dealers grew by 115%.

The turnover figures also revealed that London and New York remained the most important centres for OTC derivatives trading but that Frankfurt made significant gains, displacing Tokyo as third most important trading centre (Table C.4).

2.2 *Notional amounts outstanding and gross market values*

While the turnover data provide a snapshot of activity in the month of April 2001, a somewhat different perspective is provided by notional amounts

outstanding, which give an idea of the “cumulative” amount of business (Table C.5). At the end of June 2001, global OTC positions in all categories of market risk (including equity, commodity, credit and “other” derivatives) stood at nearly \$100 trillion, a 38% increase relative to the 1998 survey. This nonetheless represented a slowdown in the rate of expansion relative to 1998.

Moreover, as was the case for the turnover data, there was a divergent pattern of activity between the two market segments, with the stock of foreign exchange products declining by 7% and that of interest rate contracts growing by 58% (Table C.6). In contrast to the turnover data, the most recent positions data confirm the predominance of interest rate over currency products.

Positions data also show a rapid expansion of the market for credit derivatives (Table C.6). That market segment has benefited from a widening in the range of instruments and from improvements in market infrastructure.

Data on the maturity structure of foreign exchange and interest rate contracts (Tables C.7 and C.8) show an overall lengthening in the maturity of outstanding positions. The stock of short-term foreign exchange contracts declined significantly, while that of longer-term foreign exchange and interest rate instruments expanded notably.

Gross market values, which measure the transfer of wealth in OTC markets at current market prices, rose from \$2.6 trillion at the end of June 1998 to \$3 trillion at the end of June 2001. When set in relation to notional amounts outstanding, the ratio declined from 3.6% to 3.1%. This was somewhat surprising given the evolution of global financial markets between the two reporting periods. Market volatility was not markedly higher in the first half of 2001 than in the same period in 1998, but market variables, such as short-term interest rates in some of the major industrialised countries, traced a rapid descent, which would have been expected to generate large movements in market values. The reasons for the decline in the ratio of gross market values to notional amounts would warrant further investigation.

It should also be stressed that gross market values overstate the derivatives-related credit exposures of reporting institutions, which are significantly reduced by netting and collateral arrangements. Such credit exposures stood at \$1 trillion in June 2001.

B. Traditional foreign exchange markets

1. Global turnover

Global FX turnover declines between April 1998 and April 2001

Foreign exchange market activity declined markedly between 1998 and 2001. This is in sharp contrast to the previous surveys, which had shown substantial growth in trading volumes. Average daily turnover in traditional foreign exchange markets was estimated at \$1,200 billion in April 2001 compared to \$1,490 billion in April 1998, representing a 19% decline (Table B.1).⁵

Global foreign exchange market turnover ¹					
Daily averages in April, in billions of US dollars					
	1989	1992	1995	1998 ²	2001
Spot transactions	317	394	494	568	387
Outright forwards	27	58	97	128	131
Foreign exchange swaps	190	324	546	734	656
Estimated gaps in reporting	56	44	53	60	26
Total "traditional" turnover	590	820	1,190	1,490	1,200
<i>Memo: Turnover at April 2001 exchange rates³</i>	570	750	990	1,400	1,200

¹ Adjusted for local and cross-border double-counting. ² Revised since the previous survey. ³ Non-US dollar legs of foreign currency transactions were converted from current US dollar amounts into original currency amounts at average exchange rates for April of each survey year and then reconverted into US dollar amounts at average April 2001 exchange rates. Table B.1

Several possible determinants of the contraction

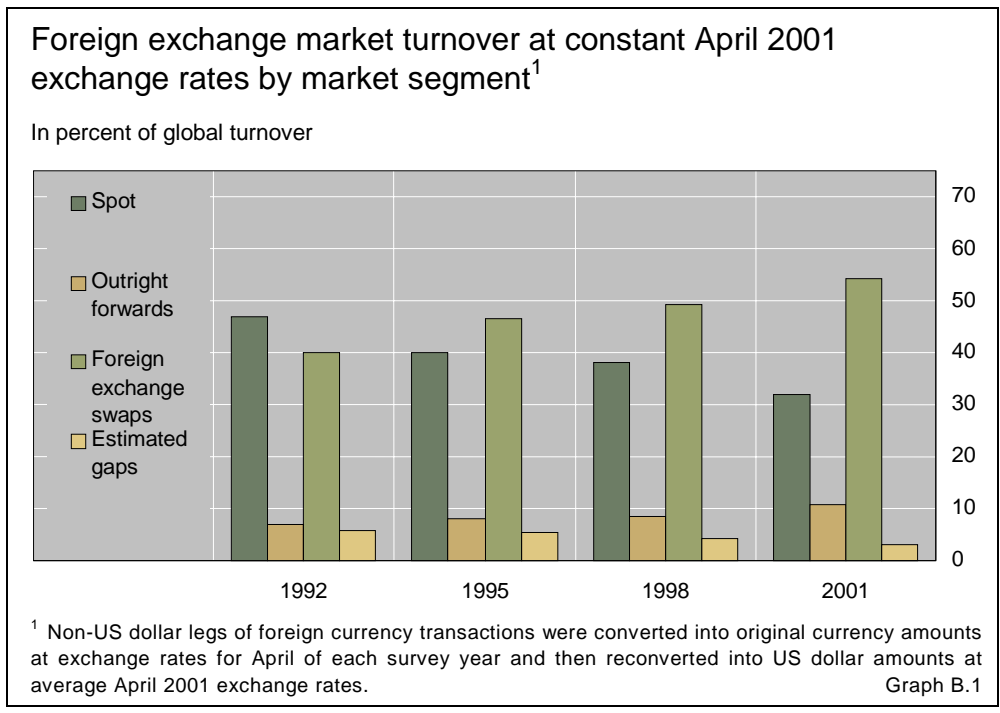
At constant exchange rates, this implied a decline of 14% since April 1998.⁶ The decline in foreign exchange market turnover in April 2001 compared to the rising trend between the previous surveys does not reflect a change in the pattern of exchange rate volatility (Table B.2). Rather, the introduction of the

Volumes and volatility of foreign exchange turnover ¹								
	April 1992		April 1995		April 1998		April 2001	
	Volume	Volatility	Volume	Volatility	Volume	Volatility	Volume	Volatility
USD/EUR ²	192	10.00	254	10.45	290	5.72	354	15.61
USD/JPY	155	8.12	242	17.05	256	11.75	231	10.82
USD/GBP	77	9.66	78	5.65	117	5.31	125	9.08
USD/CHF	49	11.47	61	12.71	79	7.90	57	14.94
EUR ² /JPY	18	8.73	24	16.76	24	10.99	30	19.97
EUR ² /GBP	23	5.84	21	8.47	31	6.04	24	8.65
EUR ² /CHF	13	4.57	18	3.62	18	3.88	12	3.05

¹ Volumes in billions of US dollars; volatilities in terms of standard deviations of annualised daily returns computed over calendar months. ² Prior to 1999, Deutsche mark. Table B.2

⁵ The six emerging market countries that in 2001 participated in the survey for the first time captured about 0.2% of total foreign exchange turnover (see Table B.7).

⁶ See footnote 3.



euro, the growing share of electronic broking in the spot interbank market, consolidation in the banking industry and international concentration in the corporate sector appear to have been the main factors driving the fall in turnover.⁷ Moreover, there may have been a lasting change in the risk tolerance of banks between April 1998 and April 2001. In particular, the financial market turbulence in the autumn of 1998 apparently led banks to reduce credit limits and to engage in less proprietary trading, thereby contributing to the contraction in foreign exchange market turnover.

2. Market segments

Among the different instruments, the decline was most pronounced in spot markets, where average daily turnover fell from \$568 billion to \$387 billion (Table B.1). Trading volumes in foreign exchange swaps dropped from \$734 billion to \$656 billion.⁸ By contrast, trading in outright forwards increased slightly to \$131 billion. These changes are consistent with a trend towards a reduction in the share of spot turnover and a rise in the share of swaps in overall foreign exchange market turnover that has been evident since 1992 (Graph B.1).

Declining share of spot turnover

⁷ See Galati (2001).

⁸ Foreign exchange swaps commit two counterparties to the exchange of two cash flows and involve the sale of one currency for another in the spot market with the simultaneous repurchase of the first currency in the forward market. By contrast, currency swaps (or cross-currency swaps), which are discussed in the next section on OTC derivatives markets, commit two counterparties to several cash flows, which in most cases involve an initial exchange of principal and a final re-exchange of principal upon maturity of the contract, and in all cases several streams of interest payments. See instrument definitions and categorisation in Section D.6 below.

3. Types of counterparty

Substantial fall in inter-dealer trading ...

The April 2001 figures also reveal some changes in the relative importance of trading between different counterparties. Trading between reporting dealers fell substantially, from \$908 billion to \$689 billion (Table B.3). This can in part be explained by the growing role of electronic brokers in the spot interbank market. The use of electronic brokers implies that foreign exchange dealers generally need to trade less actively among themselves. The contraction in interbank trading seems also to reflect the growing concentration in the banking industry and the consequent reduction in foreign exchange trading desks. Transactions between banks and non-financial customers also fell, from \$242 billion to \$156 billion. This development might be associated with the trend towards concentration in the corporate sector through the centralisation of corporate treasury functions and the consequent increase in intracompany netting of foreign exchange flows. It may also reflect the acceleration over the last few years of the trend towards a cross-border consolidation in the corporate sector.⁹ By contrast, trading between banks and financial customers increased from \$279 billion to \$329 billion.

... and in business with non-financial customers

More active asset managers boost bank to financial customer trading

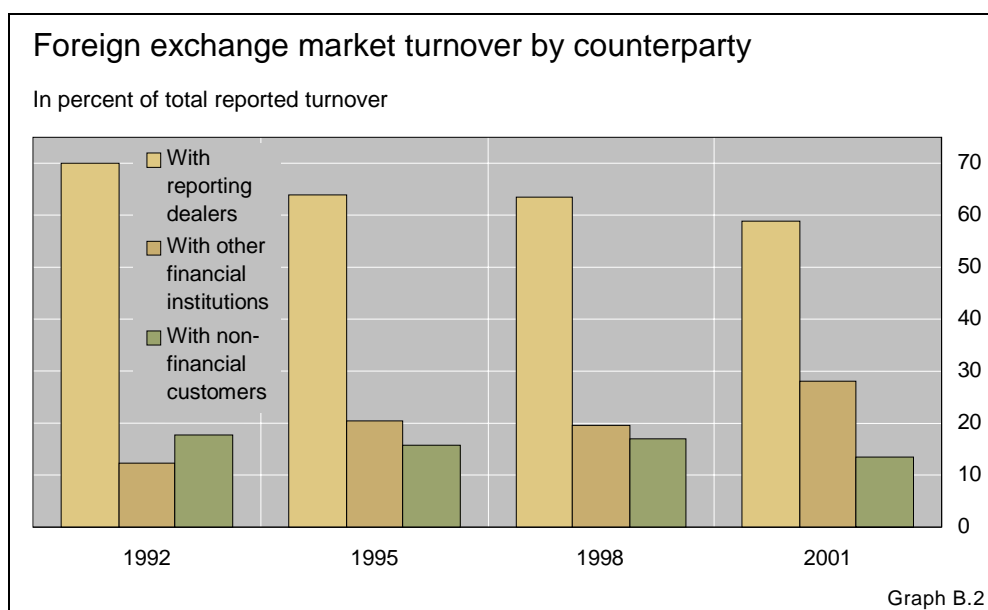
The higher trading volumes between banks and other financial institutions seem to have reflected the increasing role of asset managers. Market commentary suggests that the role of hedge funds in foreign exchange markets has on balance declined somewhat since the previous survey.

As a result of these developments, the share of interbank trading in total turnover declined from 64% to 59%, the share of bank to non-financial customer trading fell from 17% to 13% and the share of activity between banks and non-bank financial customers rose from 20% to 28% (Graph B.2).

Reported foreign exchange market turnover by counterparty ¹				
Daily averages in April, in billions of US dollars				
	1992	1995	1998 ²	2001
Total	776	1,137	1,429	1,173
with reporting dealers	540	729	908	689
with other financial institutions	97	230	279	329
with non-financial customers	137	178	242	156
Local	317	526	657	499
Cross-border	392	611	772	674

¹ Adjusted for local and cross-border double-counting. Excludes estimated gaps in reporting. ² Revised since the previous survey. Table B.3

⁹ The decline in non-financial customer activity cannot be reconciled with global trends in real output or trade in goods in services.



4. Currency composition

The introduction of the euro appears to have reduced turnover mainly through the elimination of intra-EMS trading. The April 2001 statistics show that the euro entered on one side of 38% of all foreign exchange transactions (Table B.4). This share is higher than the Deutsche mark's share in 1998 (30%) but lower than that of all euro constituents taken together in 1998 (53%). This is mainly due to the elimination of trading between the legacy currencies of the euro.¹⁰ The relative importance of other currencies seems not to have changed substantially since 1998. The dollar's share in foreign exchange markets edged up from 87% in 1998 to 90% in 2001. The yen's share increased slightly to 23% in 2001. The pound sterling was on one side of 13% of all foreign exchange transactions in 2001, a 2 percentage point rise since 1998, while the share of the Swiss franc dropped by 1 percentage point to 6%. Other currencies whose market share rose include the Canadian and Australian dollars, the Swedish krona and the Hong Kong dollar. The combined share of emerging market currencies also increased noticeably, from 3% to 5% of total foreign exchange turnover.

Dollar/euro was by far the most traded currency pair in 2001 and accounted for 30% of global turnover (Table B.6). It was followed by dollar/yen with 20% and dollar/sterling with 11%. In foreign exchange markets in emerging market countries, the dollar still remains the dominant currency, with the exception of parts of eastern Europe (Annex Table E.4). In 2001, the euro captured a dominant market share in the Czech Republic and Hungary but continued to be outweighed by the dollar in Poland and Russia.

EMU reduces turnover mainly through the elimination of intra-EMS trading

Dollar/euro by far the most traded currency pair

¹⁰ See Galati (2001).

Currency distribution of reported foreign exchange market turnover¹

Percentage shares of average daily turnover in April

	1989	1992	1995	1998 ²	2001
US dollar	90.0	82.0	83.3	87.3	90.4
Euro	...	...	...	...	37.6
Deutsche mark ³	27.0	39.6	36.1	30.1	...
French franc	2.0	3.8	7.9	5.1	...
ECU and other EMS currencies	4.0	11.8	15.7	17.3	...
Japanese yen	27.0	23.4	24.1	20.2	22.7
Pound sterling	15.0	13.6	9.4	11.0	13.2
Swiss franc	10.0	8.4	7.3	7.1	6.1
Canadian dollar	1.0	3.3	3.4	3.6	4.5
Australian dollar	2.0	2.5	2.7	3.1	4.2
Swedish krona ⁴	...	1.3	0.6	0.4	2.6
Hong Kong dollar ⁴	...	1.1	0.9	1.3	2.3
Singapore dollar ⁴	...	0.3	0.3	1.2	1.1
Emerging market currencies ^{4,5}	...	0.5	0.4	3.0	5.2
Other	22.0	8.5	7.9	9.3	10.1
All currencies	200.0	200.0	200.0	200.0	200.0

¹ Because two currencies are involved in each transaction, the sum of the percentage shares of individual currencies totals 200% instead of 100%. The figures relate to reported "net-net" turnover, ie they are adjusted for both local and cross-border double-counting, except for 1989 data, which are available only on a "gross-gross" basis. More details about emerging market and other currencies are provided in Annex Tables E.1.1 and E.1.2. ² Revised since the previous survey. ³ Data for April 1989 exclude domestic trading involving the Deutsche mark in Germany. ⁴ For 1992-98, the data cover home currency trading only. ⁵ For 1992 and 1995, South African rand; for 1998 and 2001, Brazilian real, Chilean peso, Czech koruna, Indian rupee, Korean won, Malaysian ringgit, Mexican peso, Polish zloty, Russian rouble, Saudi riyal, South African rand, Taiwan dollar and Thai baht.

Table B.4

5. Market concentration

Consolidation has accelerated in recent years

The consolidation trend in the banking industry that started in the mid-1990s appears to have continued between 1998 and 2001. This is evident from the overall decline in the number of reporting banks for the 26 countries that participated in the last three surveys: 1,945 in 2001 compared to 2,205 in 1998 and 2,417 in 1995. The total number of reporters was about 2,530 in 48 countries in 2001, compared to 3,087 in 43 countries in 1998. There is also evidence of a broad trend towards a contraction in the number of banks accounting for 75% of local turnover since the mid-1990s (Table B.5). In the United States, 75% of forex market transactions were conducted by only 13 banks in 2001 compared to 20 banks in 1998 and about 20 banks in 1995. In the United Kingdom, 17 banks captured 75% of the market in 2001 compared to 24 banks in 1998 and about 20 banks in 1995.

Concentration in the banking industry							
	1992	1995		1998		2001	
	Number of participants	Number of participants	Number of banks covering 75%	Number of participants	Number of banks covering 75%	Number of participants	Number of banks covering 75%
United Kingdom	352	313	20 ¹	293	24	257	17
United States	180	130	20 ²	93	20	79	13
Japan	330	345	24	356	19	342	17
Singapore	208	218	25	206	23	192	18
Germany	81	80	10	57	9	33	5
Switzerland	105	114	5	64	7	42	6
Hong Kong SAR	375	376	13–22 ³	366	26	272	14
Australia	72	75	10 ²	66	9	54	10
France	50	77	7–12 ³	84	7	113	6
Canada	45	38	6–7 ³	36	5–7 ³	28	4–6 ³

¹ 68%. ² 70%. ³ Depending on the market segment.

Table B.5

In comparing statistics on reporting banks, it is important to highlight that the reporters covered by the turnover part of the Triennial Survey are individual offices of trading firms rather than banking organisations on a consolidated basis. This implies that statistics on global concentration of foreign exchange business in the banking sector, eg the number of banking organisations accounting for 75% of global trading, cannot be calculated.

A caveat on measuring concentration

Bank mergers, in part spurred by EMU, have led to the contraction in the number of market participants. The acceleration of the consolidation in the banking sector has led to a reduction in the number of trading desks and contributed to the decline in turnover, in particular in the interbank market.

6. Geographical distribution

The geographical distribution of foreign exchange trading appears not to have changed substantially over the last three years (Table B.7).¹¹ Turnover fell in most countries, with some notable exceptions.

No significant change in geographical distribution

In Japan, turnover increased mainly because of a surge in cross-border foreign exchange swaps. In Sweden and Canada, a relaxation of restrictions on institutional investors boosted foreign exchange market activity. In Australia, activity rose as a number of global players have centred their Asian time zone

Turnover increase in some countries

¹¹ The reference here is also to individual banking offices rather than banking organisations.

Reported foreign exchange market turnover by currency pair¹

Daily averages in April, in billions of US dollars and percentages

	1992		1995		1998 ²		2001	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share
US dollar/euro	...	...	...	...	...	...	354	30
US dollar/mark	192	25	254	22	290	20	...	...
US dollar/French franc	19	2	51	4	58	4	...	...
US dollar/ECU	13	2	18	2	17	1	...	...
US dollar/other EMS	43	6	104	9	172	12	...	...
US dollar/yen	155	20	242	21	256	18	231	20
US dollar/sterling	77	10	78	7	117	8	125	11
US dollar/Swiss franc	49	6	61	5	79	5	57	5
US/Canadian dollar	25	3	38	3	50	3	50	4
US/Australian dollar	18	2	29	3	42	3	47	4
US dollar/other	48	6	72	6	167	12	195	17
Euro/yen	...	...	...	...	...	...	30	3
Euro/sterling	...	...	...	...	...	...	24	2
Euro/Swiss franc	...	...	...	...	...	...	12	1
Euro/other	...	...	...	...	...	...	21	2
Mark/yen	18	2	24	2	24	2	...	...
Mark/sterling	23	3	21	2	31	2	...	...
Mark/Swiss franc	13	2	18	2	18	1	...	...
Mark/French franc	10	1	34	3	10	1	...	...
Mark/ECU	6	1	6	1	3	0	...	...
Mark/other EMS	21	3	38	3	34	2	...	...
Mark/other	20	3	16	1	20	1	...	...
Other EMS/other EMS ³	3	0	3	0	4	0	...	...
Other currency pairs	23	3	30	3	38	2	27	2
All currency pairs	776	100	1,137	100	1,430	100	1,173	100

¹ Adjusted for local and cross-border double-counting. Data in this table are not directly comparable with Table B.4 for currency groups. ² Revised since the previous survey. ³ The data cover home currency trading only. Table B.6

foreign exchange business in Australia. Market commentary pointed to a tendency among commercial banks in some continental European countries to move foreign exchange business to London, while in some other countries banks tended to concentrate their business in their home country. On balance, these two trends appeared to have offset each other, as the United Kingdom's share in total trading was little changed over 1998.

Geographical distribution of reported foreign exchange market turnover¹

Daily averages in April, in billions of US dollars and percentages

	1989		1992		1995		1998		2001	
	Amount	% share	Amount	% share	Amount	% share	Amount	% share	Amount	% share
Australia	29	4.0	29	2.7	40	2.5	47	2.4	52	3.2
Austria	...	...	4	0.4	13	0.8	11	0.6	8	0.5
Bahrain	3	0.4	4	0.4	3	0.2	2	0.1	3	0.2
Belgium	10	1.4	16	1.5	28	1.8	27	1.4	10	0.6
Brazil ²	...	...	...	...	...	...	5	0.3	5	0.3
Canada	15	2.1	22	2.0	30	1.9	37	1.9	42	2.6
Chile	...	...	...	...	...	...	1	0.1	2	0.1
China ³	...	...	...	...	...	...	0	0.0	0	0.0
Colombia	...	...	...	...	...	...	...	...	0	0.0
Czech Republic	...	...	...	...	...	...	5	0.3	2	0.1
Denmark	13	1.8	27	2.5	31	2.0	27	1.4	23	1.4
Finland ⁴	3	0.4	7	0.7	5	0.3	4	0.2	2	0.1
France	23	3.2	33	3.1	58	3.7	72	3.7	48	3.0
Germany	...	...	55	5.1	76	4.8	94	4.8	88	5.4
Greece	0	0.0	1	0.1	3	0.2	7	0.4	5	0.3
Hong Kong SAR	49	6.8	60	5.6	90	5.7	79	4.0	67	4.1
Hungary	...	...	...	...	...	...	1	0.1	1	0.0
India	...	...	...	...	...	...	2	0.1	3	0.2
Indonesia	...	...	...	...	...	...	2	0.1	4	0.2
Ireland	5	0.7	6	0.6	5	0.3	10	0.5	8	0.5
Israel	...	...	...	...	...	...	...	...	1	0.0
Italy	10	1.4	16	1.5	23	1.5	28	1.4	17	1.0
Japan ⁵	111	15.5	120	11.2	161	10.2	136	6.9	147	9.1
Korea	...	...	...	...	...	...	4	0.2	10	0.6
Luxembourg	...	...	13	1.2	19	1.2	22	1.1	13	0.8
Malaysia	...	...	...	...	...	...	1	0.1	1	0.1
Mexico	...	...	...	...	...	...	9	0.5	9	0.5
Netherlands	13	1.8	20	1.9	26	1.7	41	2.1	30	1.9
New Zealand	...	...	4	0.4	7	0.4	7	0.4	4	0.2
Norway	4	0.6	5	0.5	8	0.5	9	0.5	13	0.8
Peru	...	...	...	0.0	...	0.0	...	...	0	0.0
Philippines	...	...	...	...	...	...	1	0.1	1	0.1
Poland ⁶	...	...	...	...	...	...	3	0.2	8	0.5
Portugal	1	0.1	1	0.1	2	0.1	4	0.2	2	0.1
Russia	...	...	...	...	...	...	7	0.4	10	0.6
Saudi Arabia	...	...	...	...	...	...	2	0.1	2	0.1
Singapore	55	7.7	74	6.9	105	6.7	139	7.1	101	6.2
Slovak Republic	...	...	...	...	...	...	...	...	1	0.0
Slovenia	...	...	...	...	...	...	...	...	0	0.0
South Africa	...	...	3	0.3	5	0.3	9	0.5	10	0.6
Spain	4	0.6	12	1.1	18	1.1	19	1.0	8	0.5
Sweden	13	1.8	21	2.0	20	1.3	15	0.8	24	1.5
Switzerland	56	7.8	66	6.1	87	5.5	82	4.2	71	4.4
Taiwan, China	...	...	...	...	...	...	5	0.3	4	0.2
Thailand	...	...	...	...	...	...	3	0.2	2	0.1
Turkey	...	...	...	...	...	...	...	...	1	0.1
United Kingdom	184	25.6	291	27.0	464	29.5	637	32.5	504	31.1
United States	115	16.0	167	15.5	244	15.5	351	17.9	254	15.7
Total ⁵	718	100.0	1,076	100.0	1,572	100.0	1,969	100.0	1,618	100.0

¹ Adjusted for local double-counting ("net-gross"). Estimated coverage of the foreign exchange market ranged between 90 and 100% in most countries. ² Data for 1998 cover spot transactions only. ³ Data cover spot transactions only. ⁴ Data for 1992 not adjusted for local double-counting. ⁵ Revised for 1998. ⁶ Data cover interbank transaction only. Table B.7

Basic features of the April 2001 foreign exchange market survey						
	Coverage in percentage	Number of banks covering 75%	Number of participants ¹	Number of trading days	Nature of turnover	
					in April	preceding six months
Australia	100	10	54 (66)	17	normal	steady
Austria	90	3	8 (10)	20	normal	steady
Bahrain	95	4	37 (34)	20	above	
Belgium	over 90	4	5 (30)	19	below	steady-dec ³
Brazil	100	4-6	26	20	normal	steady
Canada	100	4-6	28 (36)	20	normal	steady
Chile	100	11	28 (28)	20	normal	increasing
China			(426)	21		
Colombia	90	8	19 (-)	19	normal	increasing
Czech Republic	over 90	6	19 (26)	20	normal	increasing
Denmark	99	3	11 (16)	18	normal-below	steady-inc ²
Finland	100	2	10 (13)	19	normal	steady-inc ²
France	95-98	6	113 (84)	20	below	decreasing
Germany	95	5	33 (57)	19	normal	steady
Greece	90	3	14 (20)	19	below	decreasing
Hong Kong SAR	about 100	14	272 (366)	20	normal	steady
Hungary	99	10	40 (39)	20	normal	steady
India	78	11	23 (20)	17	normal	increasing
Indonesia	60-75		15 (25)	20	normal	steady
Ireland	100	6	78 (70)	19	normal	steady
Israel	99	5	21 (-)	20	above	steady
Italy	80	6	44 (33)	19	normal-below	steady-inc ²
Japan	100	17	342 (356)	20	normal	steady
Korea	99	14	71 (-)	20	normal	steady
Luxembourg	100	12	197 (223)	21	below	decreasing
Malaysia	75	9	9 (5)	24	normal	steady
Mexico	70	4	5 (6)	19	below	increasing
Netherlands	95	4	16 (20)	19	normal	steady-inc ²
New Zealand	80-90	4	5 (6)	18	normal	steady
Norway	90	3	11 (19)	18	below	steady
Peru	80	7	9 (-)	19	above	steady
Philippines	95	10	42 (51)	18	normal	steady
Poland	85-95	9	17 (20)	20	normal	increasing
Portugal	100	5	41 (44)	19	normal	increasing
Russia	99	20	78 (26)	21	normal	increasing
Saudia Arabia	90	6	11 (11)	22	normal	steady
Singapore	100	18	192 (206)	20	normal	steady
Slovak Republic	70-100	4	6 (-)	19	normal	increasing
Slovenia	100	7	25 (-)	19	normal	steady
South Africa	100	7	30 (24)	18	normal-below	steady
Spain	87	3	20 (26)	19	normal	increasing
Sweden	90	3	4 (4)	19	normal	increasing
Switzerland	98	6	42 (64)	19	normal	steady
Taiwan, China	100	20	53 (49)	20	normal	steady
Thailand	100	11	35 (33)	18	normal-below	steady-dec ³
Turkey	93	13	23 (-)	20	below	decreasing
United Kingdom	100	17	257 (293)	19	normal	steady
United States	95	13	79 (93)	20	normal	steady

¹ Number of reporting institutions in 1998 in brackets. ² Increasing. ³ Decreasing.

Table B.8

C. Derivatives market activity

The BIS collected OTC derivatives market data from 48 reporting central banks and monetary authorities on turnover in April 2001 and from 34 reporting institutions on amounts outstanding (notional amounts and gross market values) at end-June 2001.

It should be noted at the outset that there is a difference in market coverage between the two types of series. The turnover series in Tables C.1 to C.4 only cover the two largest market segments (interest rate and foreign exchange contracts), while the amounts outstanding data in Tables C.5 to C.8 include the smaller market segments (equity, commodity and credit-related contracts). There is also a difference in reporting principle since turnover was recorded on a locational basis, whereas amounts outstanding were compiled on a consolidated basis. While the locational reporting of turnover permits a comparison of activity between the various marketplaces, consolidated reporting of positions provides a more meaningful picture of global counterparty exposure.

Methodological differences in reporting of turnover and positions data

Hence, because of differences in reporting date, market coverage and reporting principle, locational and consolidated numbers cannot be directly compared. A better basis for analysis is to compare the results of the current survey with that of the 1998 one.

In order to minimise the reporting burden, the format of the amounts outstanding part of the survey was designed to correspond to that of the regular semiannual surveys of positions in the global OTC derivatives market.¹² The main difference between the two statistical exercises is that the triennial survey encompasses a larger number of market participants, acting as a benchmark for the regular surveys.¹³ The other difference between the triennial and regular frameworks is that the triennial survey contains separate information on positions in credit derivatives, a group of products that is not surveyed on a regular basis.

Benchmark role of triennial survey

The survey reveals that the OTC derivatives market expanded at a slower pace in the most recent three-year period.¹⁴ There was a divergence in the evolution of the two largest market segments, with interest rate products

Slower and diverging expansion of the OTC market

¹² The regular surveys cover the worldwide consolidated OTC derivatives exposures of major banks and dealers in the G10 countries.

¹³ Once the total size of the market has been determined through the triennial survey, the results of the semiannual surveys are then grossed up to produce estimates of total market size for the intervening semiannual periods. This explains the discrepancy for the component major market risk categories between the triennial numbers and the corresponding semiannual data.

¹⁴ As was the case in the previous survey, central banks did not collect data on exchange-traded activity. The BIS already collects regular data series on the turnover and open interest of exchange-traded instruments and publishes them in the *BIS Quarterly Review*.

growing sharply and foreign exchange instruments contracting. Moreover, data on credit derivatives show a rapid expansion of that market segment since 1998.

1. Turnover data

1.1 Global daily turnover in OTC derivatives markets

Slowdown due to contraction of FX contracts

Average daily turnover in OTC derivatives markets (adjusted for double-counting in local and cross-border transactions) increased by 10% to \$1,387 billion, a considerable slowdown in growth relative to the 1998 survey, when daily business had expanded by 44% (Table C.1). This slowdown reflected a number of structural influences affecting the foreign exchange segment (discussed in Part B), which resulted in a drop in turnover in that market segment. The higher volume of business in interest rate products resulted largely from changes in hedging and trading practices in the interest rate swap market. These factors are discussed in greater detail in subsection 1.2.

Global turnover in OTC derivatives markets									
Daily averages in billions of US dollars									
	Total			Foreign exchange ¹			Interest rate ²		
	April 1995	April 1998	April 2001	April 1995	April 1998	April 2001	April 1995	April 1998	April 2001
Total reported gross turnover	1,368	1,988	2,168	1,114	1,573	1,356	254	415	812
Adjustment for local double-counting ³	-206	-306	-306	-161	-235	-170	-45	-71	-136
Total reported turnover net of local double-counting ("net-gross")	1,162	1,682	1,862	953	1,338	1,186	209	344	676
Adjustment for cross-border double-counting ³	-323	-458	-520	-265	-379	-333	-58	-79	-187
Total reported net-net turnover	839	1,224	1,342	688	959	853	151	265	489
with reporting dealers	529	763	826	427	614	503	102	150	323
local	207	306	305	162	235	170	45	71	135
cross-border	322	457	520	265	379	333	57	78	187
with other financial institutions	181	267	376	149	178	235	32	89	142
local	90	125	161	74	79	105	16	46	57
cross-border	91	142	215	75	99	130	16	44	85
with non-financial customers	129	193	140	111	166	115	17	27	25
local	88	125	89	76	108	75	12	16	15
cross-border	41	68	50	35	58	40	5	10	10
Estimated gaps in reporting ⁴	41	39	45	32	29	22	9	10	23
Estimated global turnover	880	1,265	1,387	720	990	875	160	275	512
<i>Memo:</i>									
<i>Turnover at April 2001</i>									
<i>exchange rates</i>	710	1,170	1,387	...	...	...	...	...	...
<i>Exchange-traded products⁵</i>	1,222	1,373	2,179	17	12	10	1,205	1,361	2,169

¹ Including outright forwards and foreign exchange swaps. ² Single currency contracts only. ³ Made by halving positions vis-à-vis other local reporting dealers and other reporting dealers abroad respectively. ⁴ Estimates have been prepared for less than full coverage of derivatives market activity in the reporting countries. ⁵ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges.

Table C.1

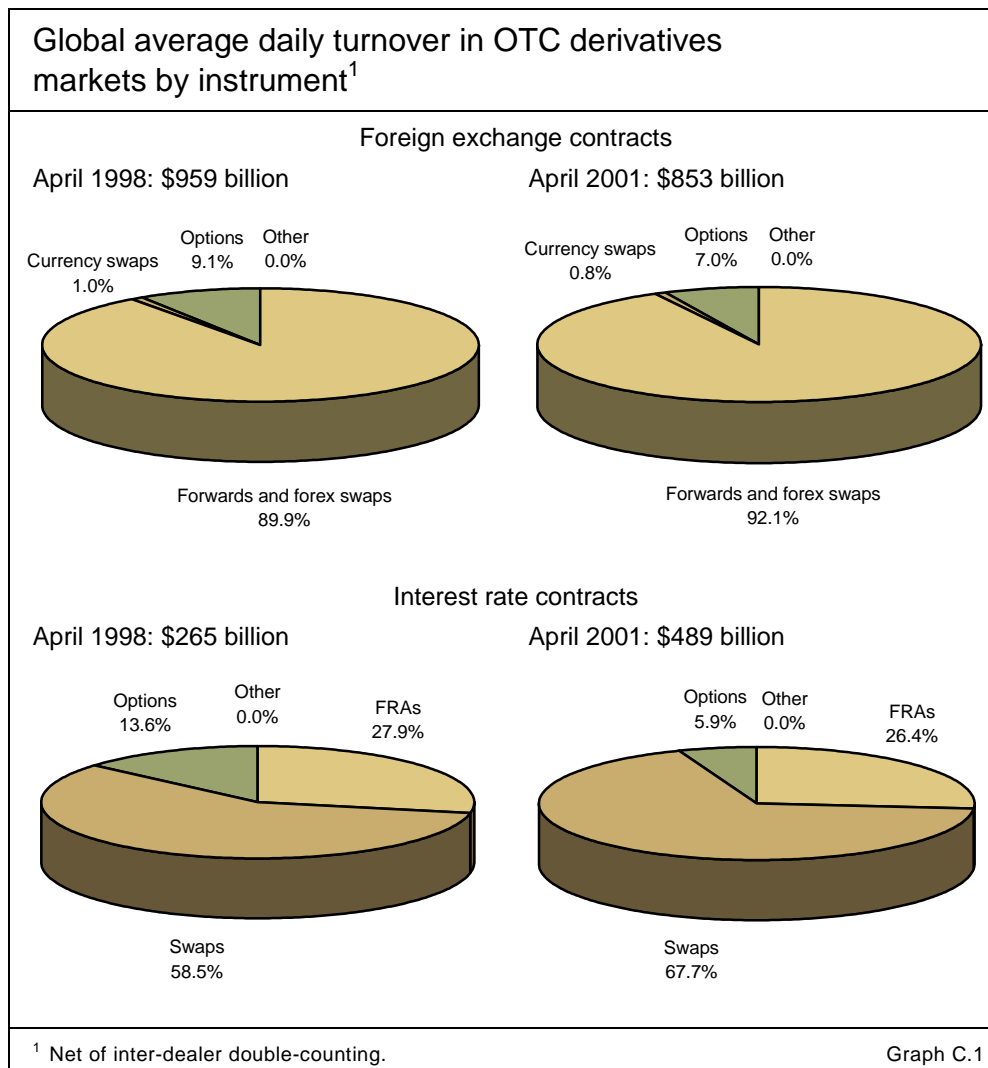
1.2 Market segments and currency composition

As shown in Table C.2, the deceleration in market growth observed in the most recent survey resulted largely from a contraction in foreign exchange instruments, whose daily turnover declined by 11% to \$853 billion. This was a major turnaround for a market segment that had seen rapid growth in the 1990s. By contrast, Table C.2 also shows that interest rate contracts grew at an even more rapid pace than in the previous three-year survey, with the daily value of transactions rising by 85% to \$489 billion.

Interest rate contracts grow faster ...

Although turnover in foreign exchange products has tended to be much larger than that of interest rate instruments, owing largely to the shorter maturity of the former, the most recent set of data shows that turnover in the interest rate segment is catching up with that in foreign exchange. Whereas interest rate contracts accounted for only 21% of aggregate OTC turnover in 1998, they made up 35% in 2001. Data from derivatives exchanges show a similar pattern, with an expansion of interest rate products and a contraction of currency instruments (see the memorandum items at the bottom of Tables C.1,

... catching up with those on interest rates



C.2 and C.3).¹⁵ However, with currency risk management remaining the preserve of the OTC market, exchanges account for only a marginal share of activity in currency products.

Slowdown in FX products is consistent with that of spot market

The contraction observed in the turnover of foreign exchange instruments was broadly spread across product groups. Thus turnover in outright forwards and foreign exchange swaps dropped by 9% to \$786 billion, while that in currency options and cross-currency swaps dropped respectively by 31% to \$60 billion and by 30% to \$7 billion. The downturn in these products is consistent with lower turnover in the spot market for foreign exchange, where business has been affected by the introduction of the euro, the growing share of electronic broking and consolidation in the banking industry.

Sharp drop in FX contracts involving euro zone currencies

Contracts involving the US dollar continued to dominate turnover in the OTC foreign exchange market (92%). As shown in Table C.3, the dollar segment of turnover in foreign exchange contracts declined by 11% to \$787 billion a day in April 2001. However, the most notable development was the sharp contraction in dollar contracts involving the currencies of euro zone countries, with turnover dropping by 34% to \$256 billion.¹⁶ The introduction of the euro at the beginning of 1999 explains much of this decline. By contrast, transactions involving the pound sterling bucked the trend, with a rise of 20% to \$101 billion. The introduction of the euro may have generated additional demand for UK financial assets as investors sought to diversify their portfolios, which may in turn have added to turnover. A substantial increase was also recorded in "other" currencies.

Interest rate segment driven by swaps ...

Expansion in the interest rate segment was driven by the buoyancy of interest rate swaps, with turnover rising by 114%, to \$331 billion (Table C.2). Business in dollar-denominated swaps grew even faster than in the previous survey (by 178% to \$100 billion; Table C.3), reflecting a deepening of the market driven by a shift in hedging and trading practices. The global financial market crisis that followed the default by Russia in August 1998 highlighted the risks inherent in the use of government bonds and related exchange-traded derivatives to hedge positions in non-government securities, leading market participants to seek alternative hedging instruments such as interest rate swaps. A reduction in the liquidity of US government debt following net debt repayments by the US Treasury also reinforced the shift to US dollar swaps.¹⁷

... as risk management practices evolve

¹⁵ It should be noted, however, that activity in the two types of markets cannot be directly compared owing to inherent differences in the characteristics and uses of products. In exchange-traded derivatives markets, the reversal of an initial position leads to a decline in notional stocks because of the offsetting of contracts through a central counterparty. In OTC derivatives markets, activity tends to involve the writing of new positions, which leads to a build-up of notional amounts outstanding.

¹⁶ Comparing activity in legacy currencies in 1998 with that in the euro in 2001.

¹⁷ For a more detailed treatment of the issues involved, see *The changing shape of fixed income markets: a collection of studies by central bank economists*, BIS Papers, no 5, October 2001 and Robert N McCauley, "Benchmark tipping in the money and bond markets", in the March 2001 issue of the *BIS Quarterly Review*, pp 39-45.

Global OTC derivatives market turnover ¹			
Daily averages in April, in billions of US dollars			
Category	1995	1998	2001
Foreign exchange turnover	688	959	853
Outright forwards and foreign exchange swaps	643	862	786
Currency swaps	4	10	7
Options	41	87	60
Other	1	0	0
Interest rate turnover	151	265	489
FRAs	66	74	129
Swaps	63	155	331
Options	21	36	29
Other	2	0	0
Total derivatives turnover ²	880	1,263	1,387
<i>Memo:</i>			
Turnover at April 2001 exchange rates	710	1,170	1,387
Exchange-traded derivatives ³	1,222	1,373	2,179
Currency contracts	17	12	10
Interest rate contracts	1,205	1,361	2,169

¹ Adjusted for local and cross-border double-counting. ² Including estimates for gaps in reporting. ³ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Reported monthly data were converted into daily averages on the assumption of 18.5 trading days in 1995, 20.5 days in 1998 and 19.5 days in 2001.
Table C.2

Moreover, vigorous US monetary easing in the wake of a pronounced deceleration of economic growth probably fuelled hedging and position-taking in the dollar swap market.

Activity in euro-denominated interest rate swaps also expanded rapidly (by 104% to \$173 billion).¹⁸ The introduction of the euro in January 1999 led to the creation of a large and liquid market in euro-denominated swaps. With European government bond markets remaining heterogeneous, the euro-denominated swap curve has in effect become a new benchmark for European fixed income markets.

Creation of large market in euro-denominated swaps

By contrast, trading in yen-denominated interest rate swaps expanded more slowly (by 14% to \$16 billion), with activity remaining below that recorded in 1995. The low volume of business may have reflected a fairly widespread view at the time of the survey that Japanese interest rates would evolve in a narrow range for the foreseeable future.

Slow expansion of yen swaps

Trading in FRAs witnessed a fairly strong and broad-based expansion (by 74% to \$129 billion), following slower growth in the previous reporting period. By contrast, activity in interest rate options, a much smaller segment of the OTC interest rate market, contracted by 19% to \$29 billion. Much of the decline occurred in the yen segment.

¹⁸ Comparing activity in legacy currencies in 1998 with that in the euro in 2001.

Reported turnover in OTC derivatives markets by currency pair¹

Daily averages in billions of US dollars

Foreign exchange contracts									
	Total			of which					
				Outright forwards			Forex swaps		
	April 1995	April 1998	April 2001	April 1995	April 1998	April 2001	April 1995	April 1998	April 2001
US dollar with other currencies	630	880	787	77	103	111	518	698	623
Euro	...	...	256	...	...	40	...	...	199
Deutsche mark	122	165	...	18	22	...	93	124	...
Japanese yen	169	181	169	22	26	26	133	118	125
Pound sterling	53	84	101	5	10	11	46	69	86
Other EMS currencies	147	223	...	15	18	...	129	197	...
Other	139	227	260	17	27	34	117	190	213
Euro with other currencies ²	...	...	47	...	...	15	...	...	22
Japanese yen	...	...	18	...	...	6	...	...	6
Pound sterling	...	...	14	...	...	4	...	...	8
Other	...	...	15	...	...	5	...	...	8
Deutsche mark with other currencies ²	39	53	...	12	14	...	19	22	...
Japanese yen	7	11	...	3	3	...	2	2	...
Pound sterling	5	11	...	1	3	...	2	3	...
Other EMS currencies	20	14	...	5	5	...	10	7	...
Other	8	16	...	3	3	...	5	10	...
Japanese yen with other currencies ³	2	6	3	1	3	2	1	2	1
Other currency pairs	17	20	15	4	6	4	7	11	9
All currency pairs	688	959	853	97	128	131	546	734	656
<i>Memo:</i> <i>Exchange-traded currency contracts⁵</i>	17	12	10	...	...	...	...	...	...
Interest rate contracts ⁴									
	Total			of which					
				FRAs			Swaps		
	April 1995	April 1998	April 2001	April 1995	April 1998	April 2001	April 1995	April 1998	April 2001
US dollar	41	71	152	18	23	39	17	36	100
Euro	...	...	231	...	...	48	...	...	173
Deutsche mark	18	63	...	9	9	...	7	47	...
Japanese yen	35	27	27	10	3	9	17	14	16
Pound sterling	...	17	37	...	8	12	...	8	23
Other EMS currencies	...	59	...	...	17	...	...	38	...
Other	58	28	42	30	14	21	22	12	19
Total turnover	151	265	489	66	74	129	63	155	331
<i>Memo:</i> <i>Exchange-traded interest rate contracts⁵</i>	1,205	1,361	2,169	...	...	...	...	...	...

¹ Adjusted for local and cross-border double-counting. ² Excluding the US dollar. ³ Excluding the US dollar and the Deutsche mark and euro respectively. ⁴ Single currency contracts only. ⁵ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Reported monthly data were converted into daily averages on the assumption of 18.5 trading days in 1995, 20.5 days in 1998 and 19.5 days in 2001. Table C.3

1.3 Types of counterparty

Overall, business with non-reporting financial institutions grew at a more rapid pace (by 41% to \$376 billion; Table C.1) than transactions within the group of reporting dealers (by 8% to \$826 billion), while transactions with non-financial customers declined (by 27% to \$140 billion).

There was, however, a major difference in the evolution of counterparty business between the two main groups of products. Thus, in the area of foreign exchange derivatives, business within the group of reporting dealers declined by 18% to \$503 billion. This contraction in inter-dealer business may have been related to the broad factors that affected the spot market (discussed in Part B). In the area of interest rate products, however, activity within the group of reporting dealers grew by 115% to \$323 billion.

Business conducted by the other groups of counterparties offered a more homogeneous picture. Thus transactions with non-reporting financial entities rose by 32% in the foreign exchange segment and by 60% in the interest rate market, while that with non-financial customers declined by 31% and 7% respectively in the two compartments. The continued growth of business with non-reporting financial institutions is thought to reflect the greater weight of institutional fund managers (including hedge funds) in derivatives markets. The decline in business with non-financial customers is somewhat surprising, perhaps indicating an aversion to using certain types of derivatives as accounting and reporting requirements became more stringent.¹⁹ Nevertheless, it shows that end-users have yet to make greater use of such risk management tools.

Lastly, cross-border activity grew by 18%, while local business stagnated. Cross-border contracts now account for 57% of total activity, illustrating the increasingly global nature of the derivatives business. Again, the foreign exchange and interest rate segments followed divergent paths. In the first group of products, cross-border and local activity both declined, while in the second group both types of transactions expanded.

1.4 Geographical distribution

The most important centres for OTC derivatives trading remained London and New York, which kept their positions as number one and number two marketplaces (Table C.4). London maintained its share of global activity, with daily trading rising by 6% to \$628 billion, while New York lost in relative importance, with transactions dropping by 3% to \$285 billion. There was also a significant reshuffling of relative positions in the other major trading centres.

Diverging evolution of counterparty business between FX and interest rate products

Continued growth of business by non-reporting financial entities

Cross-border activity grows but local business stagnates

London and New York keep their top positions ...

¹⁹ The US Financial Accounting Standards Board (FASB) introduced new rules on derivatives and hedge accounting for all publicly traded US companies with a fiscal year ending on 15 June 2000. FASB Statement no 133 requires companies to record derivatives on their balance sheets as assets or liabilities that will be measured at fair value. Companies have to record in their income statements or in "Other comprehensive income" any changes in the value of such instruments designated as hedges that do not closely offset changes in the value of the underlying assets.

Geographical distribution of reported OTC derivatives market activity¹

Average daily turnover in billions of US dollars

	Total		Foreign exchange ²		Interest rate ³	
	April 1998	April 2001	April 1998	April 2001	April 1998	April 2001
Australia	31.6	50.7	28.8	40.9	2.8	9.8
Austria	9.7	8.2	6.4	4.0	3.3	4.2
Bahrain	1.1	1.7	0.9	1.5	0.2	0.2
Belgium	24.9	21.8	20.1	7.8	4.9	14.1
Brazil	...	2.1	...	1.9	...	0.3
Canada	33.6	43.3	27.2	33.4	6.4	9.9
Chile	0.5	0.6	0.5	0.6	0.0	0.0
China	...	0.0	...	0.0	...	0.0
Colombia	...	0.1	...	0.1	...	0.0
Czech Republic	3.0	1.4	3.0	1.2	0.0	0.2
Denmark	25.9	25.3	21.7	19.5	4.2	5.8
Finland	5.4	1.7	3.3	1.2	2.1	0.5
France	98.5	106.0	57.9	40.9	40.6	65.1
Germany	86.7	159.2	57.6	65.2	29.1	94.0
Greece	4.1	2.8	4.1	2.8	0.0	0.0
Hong Kong SAR	51.4	52.0	48.9	49.4	2.4	2.6
Hungary	0.5	0.2	0.5	0.2	0.0	0.0
India	1.3	2.0	1.3	1.8	0.0	0.1
Indonesia	1.0	0.5	1.0	0.5	0.0	0.0
Ireland	7.4	10.5	5.6	4.7	1.8	5.8
Israel	...	0.4	...	0.4	...	0.0
Italy	21.2	36.1	17.1	12.4	4.1	23.7
Japan ⁴	120.6	131.7	89.0	115.9	31.6	15.8
Korea	1.1	4.0	1.0	3.9	0.0	0.1
Luxembourg	16.9	13.4	14.9	8.9	2.0	4.5
Malaysia	0.8	0.9	0.8	0.9	0.0	0.0
Mexico	2.6	4.6	2.4	4.2	0.2	0.4
Netherlands	31.0	49.4	27.5	25.2	3.5	24.2
New Zealand	5.4	3.4	5.0	3.1	0.4	0.3
Norway	8.7	12.4	5.9	9.5	2.8	2.9
Philippines	0.4	0.6	0.4	0.6	0.0	0.0
Peru	...	0.0	...	0.0	...	0.0
Poland	0.5	3.8	0.5	3.3	...	0.5
Portugal	3.6	1.1	2.6	0.8	1.0	0.3
Russia	0.9	0.2	0.9	0.2	0.0	0.0
Saudi Arabia	1.4	1.0	1.1	0.9	0.2	0.1
Singapore	90.7	72.5	85.4	69.3	5.3	3.2
Slovakia	...	0.5	...	0.5	...	0.0
Slovenia	...	0.0	...	0.0	...	0.0
South Africa	6.0	8.4	5.2	7.9	0.8	0.6
Spain	16.6	25.9	13.7	5.5	2.9	20.5
Sweden	14.8	22.3	11.2	19.1	3.6	3.2
Switzerland	63.0	62.6	57.2	53.0	5.9	9.6
Taiwan, China	1.6	1.8	1.5	1.7	0.1	0.1
Thailand	2.2	1.3	2.2	1.3	0.0	0.0
Turkey	...	0.7	...	0.7	...	0.0
United Kingdom	591.2	628.1	468.3	390.3	122.9	237.8
United States	293.8	284.7	235.4	169.1	58.4	115.7
Total "net-gross" turnover	1,681.7	1,862.2	1,338.1	1,186.1	343.6	676.1

¹ Adjusted for local double-counting ("net-gross"). Estimated coverage of derivatives markets in individual countries ranged between 73 and 100%. ² Including outright forwards and foreign exchange swaps. ³ Single currency contracts only.

⁴ Revised for 1998.

Table C.4

Whereas in April 1998 the next largest centres were in descending order Tokyo, Paris, Singapore, Frankfurt and Zurich, in April 2001 the new ranking was Frankfurt, Tokyo, Paris, Singapore and Zurich. Frankfurt seems to have benefited from the introduction of the euro and the establishment there of the European Central Bank.

... but Frankfurt's position rises

The survey results for April 2001 also show that geographical concentration remained stable, with the top five marketplaces accounting for about 70% of total transactions. However, it should be noted that concentration can vary widely across countries, intermediaries and product groups, as a single intermediary can account for a very large share of transactions in certain product groups (as is the case in credit derivatives). Although the major dealers in the main trading centres are generally highly rated, an excessive concentration of exposures would raise questions concerning systemic stability.²⁰ Moreover, the serious difficulties faced by LTCM (a US hedge fund that had built up very large positions in OTC derivatives markets) in the autumn of 1998 show that the emergence of problems at non-reporting financial entities can also have severe repercussions for global financial markets.

Stability in geographical concentration of business

2. Notional amounts outstanding and gross market values

2.1 *Global notional amounts in OTC derivatives markets*

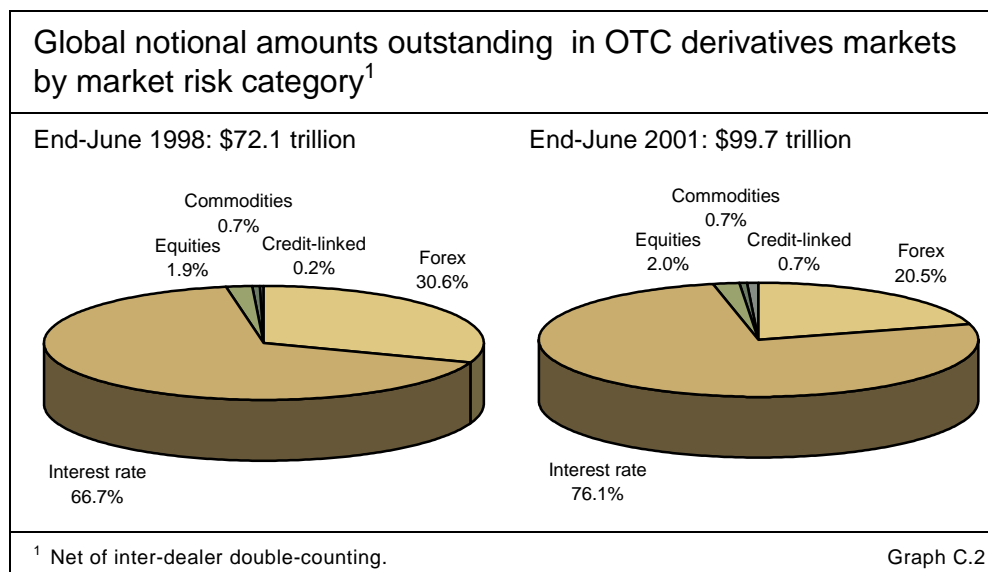
Notional amounts are used as a reference to calculate cash flows under individual contracts. They provide a measure of market risk exposures that participants choose to face at the time they engage in derivatives transactions. As shown in the third line of Table C.5, after adjusting for double-counting in local and cross-border transactions among reporting institutions, the notional amount of outstanding OTC contracts rose by 38% relative to the previous survey to reach nearly \$100 trillion at end-June 2001. This amounted to slower growth than in the previous triennial survey, which had shown an expansion of 52% in the three-year period ending in June 1998.

Slowdown in expansion of OTC positions

As was the case for the statistics on turnover, there was a divergence in the evolution of the two largest market segments, with the stock of interest rate products growing by 58% to \$75.8 trillion and that of foreign exchange instruments contracting by 7% to \$20.4 trillion (Table C.6). The stock of equity-linked contracts and other instruments, including credit derivatives, expanded rapidly (by 52% and 492% respectively) but remained small relative to the two largest market segments. The particularly rapid growth of positions in credit derivatives does not come as a surprise since this market segment is relatively new, having emerged in the mid-1990s.

Divergence in evolution of two largest market segments

²⁰ See *Issues of measurement related to market size and macroprudential risks in derivatives markets*, ECSC/BIS, February 1995.



2.2 Market segments and currency composition

Robust activity in interest rate swaps

Data on positions in Table C.6 show that overall business in interest rate contracts, the largest segment of the OTC market, grew by 58% to \$75.8 trillion. This represented a slowdown relative to the previous three-year period, when positions had increased by 81%. The market for interest rate swaps was particularly buoyant. As discussed in the section on turnover, the robustness of activity in that market segment reflects growing liquidity in a context of structural change in underlying government bond markets and in risk management practices. Meanwhile, positions in interest rate options grew by 28% to \$10.9 trillion, while those in FRAs rose by 16% to \$7.7 trillion.

Decline in stock of FX products

The aggregate notional stock of foreign exchange products declined by 7% in the three-year period to \$20.4 trillion. This was in marked contrast to previous triennial surveys, which had shown sharp increases in currency-related positions. The contraction in foreign exchange contracts is consistent with the results for the spot market for foreign exchange (as discussed in Part B). The main exception to the downward trend in currency-related positions was in cross-currency swaps with a near doubling of amounts outstanding over the three-year period to \$4.3 trillion. Regular semiannual BIS data on positions in OTC derivatives markets show that cross-currency swaps have grown steadily since the BIS began its regular collection of such data in 1998.²¹ Business has apparently been fuelled by the large global volume of syndicated loans and securities issues arranged in recent years.

At the same time, equity-linked contracts expanded by 52% to \$2 trillion, while commodity contracts grew by 33% to \$674 billion. These market segments remain much smaller than those for interest rate and foreign exchange products.

²¹ Semiannual data on positions in OTC markets are published in the *BIS Quarterly Review*.

Global positions in OTC derivatives markets						
Amounts outstanding in billions of US dollars						
	Positions at end-June 1998			Positions at end-June 2001		
	Total	Foreign exchange	Interest rates ¹	Total	Foreign exchange	Interest rates ¹
Notional amounts						
Reported positions	102,898	30,894	69,578	144,283	27,706	112,132
Adjustment for double-counting ²	-30,755	-8,839	-21,454	-44,624	-7,271	-36,319
Adjusted reported positions	72,143	22,055	48,124	99,659	20,435	75,813
<i>Memo:</i>						
<i>Total contracts at end-June 2001</i>						
<i>exchange rates</i>	68,350	...	...	99,659	...	...
<i>Exchange-traded positions³</i>	14,257	103	13,107	19,464	66	17,493
Gross market values						
Reported positions	3,568	1,359	1,903	4,224	1,269	2,536
Adjustment for double-counting ^{2,4}	-988	-377	-549	-1,180	-302	-788
Adjusted reported positions	2,580	982	1,354	3,042	967	1,748
<i>Memo:</i>						
<i>Total contracts at end-June 2001</i>						
<i>exchange rates</i>	2,480	...	...	3,042	...	...
<i>Gross credit exposure⁵</i>	1,203	...	...	1,019	...	...

¹ Single currency contracts only. ² Made by halving positions vis-à-vis other reporting dealers. ³ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. ⁴ Partly estimated. ⁵ Gross market values after taking into account legally enforceable bilateral netting agreements. Table C.5

One of the notable developments of the most recent three-year period has been the rapid expansion of the market for credit derivatives.²² Positions in these instruments, which are not included in the semiannual survey of OTC derivatives markets, expanded from \$108 billion at end-June 1998 to \$695 billion at end-June 2001 (not shown separately in Table C.6). Market participants noted that the market for credit derivatives is diversifying beyond transactions aimed at the restructuring of banks' balance sheets with the entry of new market participants such as insurance companies. Indeed, the most recent numbers show that reporting dealers accounted for only 31% of total positions, compared with 55% for non-reporting financial institutions and 14% for non-financial users. The market has also reportedly benefited from a widening in the range of instruments and from improvements in market infrastructure, such as the introduction of standardised documentation and the development of new rate of return indices. It should be noted that the size of the credit derivatives market remains fairly small, being barely larger than that for commodity contracts.²³

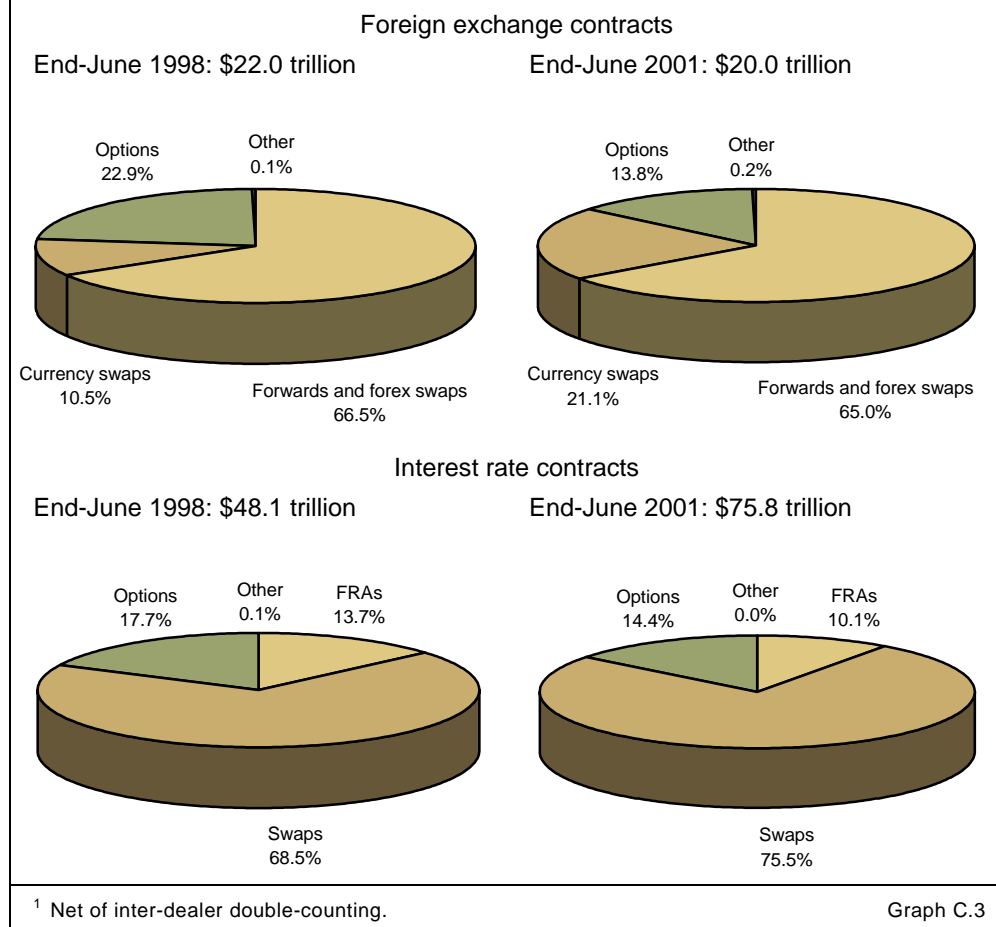
Rapid expansion of credit derivatives ...

... but market remains small

²² Credit derivative contracts enable market participants to transfer credit risk exposures. They take a variety of forms, including credit default and total return swaps.

²³ There are a variety of sources of data on the market for credit derivatives, including the British Bankers' Association, the International Swaps and Derivatives Association, government agencies and a number of trade publications. Coverage and data collection methodologies vary widely. While some of the sources collect data on a gross basis, others attempt to make adjustments for double-counting. The BIS numbers offer a global coverage and are adjusted for double-counting.

Global notional amounts outstanding in OTC derivatives markets by instrument¹



Interest rate products rise across currency segments ...

Looking at the currency composition of contracts in Tables C.7 and C.8, a significant divergence is once again apparent between interest rate and currency derivatives markets. In the interest rate derivatives markets, the stock of outstanding contracts has increased in most major currency segments. A particularly sharp rise took place in positions denominated in US dollars, with an increase of 79%. This results from the rapid development of the interest rate swap market in that currency as changes in hedging and trading practices induce market participants to make greater use of such instruments. Positions denominated in euro zone currencies have also expanded at a remarkable pace (by 62%). Here again, interest rate swaps have been a driving force as they became new benchmarks for European fixed income markets. Moreover, positions denominated in yen and sterling grew rapidly (by 55% and 57% respectively).

... but FX products see a broad decline

In the foreign exchange derivatives markets, the drop in positions was widespread, with most currency segments witnessing a decline in outstandings. In particular, positions involving the US dollar declined by 4%, while those involving euro zone currencies dropped by 21%. The main exception was with instruments involving sterling, with a 7% increase in the outstanding stock of contracts.

Global positions in OTC derivatives markets by type of instrument ¹						
In billions of US dollars						
	Positions at end-June 1998			Positions at end-June 2001		
	Notional amounts	Gross market values	Percent-ages ²	Notional amounts	Gross market values	Percent-ages ²
Foreign exchange contracts	22,055	982	4.5	20,435	967	4.7
Outright forwards and forex swaps	14,658	584	4.0	13,275	548	4.1
Currency swaps	2,324	255	11.0	4,302	339	7.9
Options	5,040	141	2.8	2,824	80	2.8
Other	33	2	6.1	33	0	0.0
<i>Memo:</i>						
<i>Exchange-traded currency contracts³</i>	103	...	...	66	...	...
Interest rate contracts ⁴	48,124	1,354	2.8	75,813	1,748	2.3
FRAs	6,602	39	0.6	7,678	32	0.4
Swaps	32,942	1,186	3.6	57,220	1,531	2.7
Options	8,528	126	1.5	10,913	185	1.7
Other	52	3	5.8	2	0	0.0
<i>Memo:</i>						
<i>Exchange-traded interest rate contracts³</i>	13,107	...	...	17,493	...	...
Equity-linked contracts	1,341	201	15.0	2,039	218	10.7
Forwards and swaps	180	22	12.0	373	54	14.5
Options	1,161	180	15.5	1,666	164	9.8
<i>Memo:</i>						
<i>Exchange-traded equity index contracts³</i>	1,047	...	...	1,905	...	...
Commodity contracts ⁵	506	39	8.0	674	88	13.0
Gold	228	9	3.9	278	24	8.6
Other	278	30	10.8	396	63	15.9
Forwards and swaps	165	...	...	235	...	...
Options	113	...	...	162	...	...
Credit-linked and other contracts	118	4	3.4	698	21	3.0
Total contracts	72,143	2,580	3.6	99,659	3,042	3.1

¹ Adjusted for inter-dealer double-counting. ² Gross market values as a percentage of notional amounts. ³ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. ⁴ Single currency contracts only. ⁵ Adjustment for inter-dealer double-counting of gross market values estimated on the basis of the 1995 triennial survey.

Table C.6

2.3 Maturity of contracts

Data on the maturity of foreign exchange and interest rate contracts (Tables C.7 and C.8) show a lengthening in the maturity structure of outstanding positions, with a significant drop in short-term foreign exchange contracts (up to one year) and robust growth in longer-term foreign exchange and interest rate contracts (over five years). Indeed, the stock of short-term currency contracts dropped by 17%, while that of long-term foreign exchange and interest rate contracts rose by 65% and 92% respectively.

Lengthening of contract maturity

Main features of positions in OTC foreign exchange derivatives markets¹

Amounts outstanding in billions of US dollars

	End-June 1998		End-June 2001	
	Notional amounts	Gross market values	Notional amounts	Gross market values
Total contracts	22,055	982	20,435	967
by counterparty				
reporting dealers	8,852	385	7,279	304
other financial institutions	8,222	368	8,690	412
non-financial customers	4,981	229	4,466	251
by maturity ²				
up to one year	19,111	...	15,906	...
between one and five years	2,214	...	3,293	...
over five years	729	...	1,206	...
by currency ³				
US dollar	19,169	914	18,341	863
Euro	...	...	7,325	366
Deutsche mark	5,271	145	...	...
French franc	1,638	43	...	...
Other EMS currencies	2,391	...	...	...
Japanese yen	6,194	384	4,888	259
Pound sterling	2,723	72	2,912	93
Swiss franc	1,266	44	996	45
Other	5,458	...	6,408	308
<i>Memo:</i>				
<i>Exchange-traded contracts⁴</i>	103	...	66	...

¹ Adjusted for inter-dealer double-counting. ² Remaining maturity. ³ Counting both currency sides of every foreign exchange transaction means that the currency breakdown sums to 200% of the aggregate. ⁴ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Table C.7

2.4 Types of counterparties

Contrasting evolution of positions

A look at transactions conducted by the various counterparties (Tables C.7 and C.8) also shows a contrasting trend in the evolution of positions. In the market for interest rate products, the share of inter-dealer positions increased over the three-year interval (from 45% to 48%) at the cost of the other two groups of counterparties. In the case of foreign exchange products, the share of reporting dealers declined (from 40% to 36%), while that of non-reporting financial institutions rose (from 37% to 43%) and that of non-financial customers remained stable.²⁴

²⁴ The weaker growth of inter-dealer exposures in foreign exchange products could reflect financial industry consolidation to the extent that mergers and acquisitions lead to a consolidation of bilateral transactions and consequently to a reduction in the outstanding stock of contracts.

Main features of positions in OTC interest rate derivatives markets ¹				
Amounts outstanding in billions of US dollars				
	End-June 1998		End-June 2001	
	Notional amounts	Gross market values	Notional amounts	Gross market values
Total contracts ²	48,124	1,354	75,813	1,748
by counterparty				
reporting dealers	21,477	543	36,320	791
other financial institutions	20,473	599	31,961	750
non-financial customers	6,174	212	7,531	208
by maturity ³				
up to one year	20,176	...	29,160	...
between one and five years	19,010	...	29,470	...
over five years	8,938	...	17,184	...
by currency				
US dollar	14,349	346	25,666	635
Euro	...	...	24,556	509
Deutsche mark	6,993	209	...	...
French franc	3,720	126	...	...
Other EMS currencies	4,479	...	...	...
Japanese yen	7,676	211	11,913	336
Pound sterling	3,846	70	6,052	112
Swiss franc	1,166	22	1,303	20
Other	5,895	...	6,323	135
<i>Memo:</i>				
<i>Exchange-traded contracts⁴</i>	<i>13,107</i>	<i>...</i>	<i>17,493</i>	<i>...</i>

¹ Adjusted for inter-dealer double-counting. ² Single currency contracts only. ³ Remaining maturity ⁴ Sources: FOW TRADEdata; Futures Industry Association; various futures and options exchanges. Table C.8

2.5 Global gross market values in OTC derivatives markets

Gross market values rose from \$2.6 trillion to \$3 trillion (Tables C.6 to C.8).²⁵ This was still considerably smaller than the total outstanding stock of domestic and international securities issues in major financial markets (\$36.2 trillion; see Annex Tables 11 and 16 A in the *BIS Quarterly Review*) or international banking assets (\$12.4 trillion; see Annex Table 1 the *BIS Quarterly Review*).

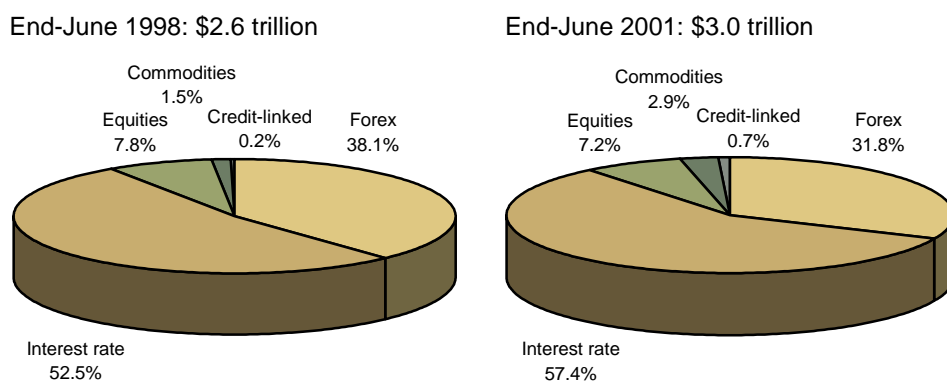
Moreover, when set in relation to notional amounts, the ratio declined from 3.6% to 3.1%. Much of the reduction in the aggregate ratio stems from a noticeable decline in the ratio for interest rate products (from 2.8% to 2.3%), which account for the bulk of gross market values and, to a lesser extent, in the

Rise in gross market values ...

... but decline relative to notional accounts outstanding

²⁵ Gross market values are defined as the sum of the positive market values of all reporters' contracts and the absolute values of the negative market values of their contracts with non-reporters (as a proxy for the positive market value of non-reporters' positions). Gross market values measure the replacement cost of all outstanding contracts had they been settled on the last day of the reporting period (30 June 2001 in the most recent survey). The gross market value of contracts is generally zero at the initiation of a contract but subsequent changes in the prices of underlying assets lead to the emergence of mark-to-market gains and losses between counterparties. Hence, gross market values tend to reflect changes in the prices or volatility of financial assets. They are a more accurate indicator of counterparty credit risk than notional amounts.

Global gross market values in OTC derivatives markets by market risk category¹



¹ Net of inter-dealer double-counting.

Graph C.4

ratio for equity-related instruments (from 15% to 10.7%). This is somewhat surprising given the evolution of financial markets between the two reporting periods. Global fixed income markets were not significantly more volatile in the first half of 2001 but short-term interest rates began a steep descent as signs of recession became increasingly clear. This resulting steepening of yield curves could have been expected to generate large movements in market values between payers of fixed and floating rates. Moreover, the volatility of equity markets increased substantially from the beginning of 2001 as stock markets began to face downward pressures. One of the possible reasons for the decline in the ratio is that the consolidation of contracts following the introduction of the euro led to some netting-out of gross market values. Further analysis would be required in order to reach more definite conclusions about the factors driving global gross market values.

It should be noted that although the ratio of gross market values to notional amounts has been fairly stable over time, it has varied considerably across individual market segments, ranging from less than 1% for FRAs to almost 16% for non-gold commodity contracts. These variations can be explained by differences in the contractual structure of instruments and in the inherent volatility of the underlying financial assets. In the specific case of the two largest market segments, the 2.3% ratio for interest rate products is about half the ratio for foreign exchange products. One reason for this difference is that most foreign exchange contracts involve an exchange of principal, while interest rate contracts ordinarily involve no such exchange.²⁶ Foreign exchange contracts also represent exposure to both currency and interest rate risks.

Lastly, it should be stressed that gross market values overstate actual credit exposures, since they exclude netting and other risk reducing arrangements. Allowing for netting lowers the derivatives-related credit exposures of reporting institutions to \$1 trillion (see Table C.5).

²⁶ Interest rate contracts often require periodic payments that in effect amortise exposures over the life of contracts. In addition, interest rates tend to be less volatile than exchange rates.

Ratio of gross market values to notional amounts varies across products

D. Methodology

This publication combines the results of the most recent triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, which was carried out by central banks and monetary authorities in 48 countries for April and end-June 2001, and the results of the semiannual OTC derivatives statistics at end-June 2001. The objective of the exercise was to obtain reasonably comprehensive and internationally consistent information on the size and structure of foreign exchange and over-the-counter (OTC) derivatives markets. The purpose of the statistics is to increase market transparency and thereby help central banks, other authorities and market participants to better monitor patterns of activity in the global financial system. The triennial survey and the regular derivatives statistics complement each other in the following way:

- The latest triennial survey covered foreign exchange and OTC derivatives turnover in April 2001, as reported by about 2,530 market participants in 48 countries on a gross and unconsolidated basis (ie in-house deals and deals with other offices of the same institution were *not* netted out).
- In addition, the triennial survey covered notional amounts outstanding and gross market values of OTC derivatives positions at end-June 2001, as reported by dealers in 27 non-G10 countries and non-regular reporters in seven G10 countries on a worldwide consolidated basis. Consolidated reporting relates to global activity of the head office and all its domestic and foreign branches and subsidiaries, with positions between own offices of the same reporting institution being netted out.
- These data were supplemented by the semiannual OTC derivatives statistics, which covered notional amounts outstanding and gross market values of OTC derivatives positions at end-June 2001, as reported by 61 dealers in the eleven G10 countries on a worldwide consolidated basis.

The data presented here are largely comparable with those of the previous triennial central bank survey in 1998 as the increase from 43 to 48 participating countries had little effect on the overall coverage of the survey (Table B.7). The format of the 2001 survey includes the following changes compared with 1998:

- The foreign exchange turnover part of the survey was expanded to cover 21 additional, mainly emerging market, currencies. However, in order to limit the reporting burden, data were only collected on total turnover for each of the additional currencies rather than broken down by currency pair as for the existing currencies.
- The section on turnover of interest rate derivatives was expanded to include nine additional currencies.

1. Coverage

The survey covered both turnover and amounts outstanding data on foreign exchange and derivatives market activity. For turnover, data were collected on foreign exchange transactions and single currency interest rate derivatives. For amounts outstanding, data were collected on the following market risk categories:

- foreign exchange contracts
- single currency interest rate derivatives
- equity, commodity, credit and “other” derivatives

For turnover, the category of foreign exchange transactions covered both cash (ie foreign exchange spot transactions) and derivative instruments. All other categories for turnover and amounts outstanding comprised derivative instruments only. For derivatives, in principle the following instrument breakdown was requested in each market risk category:

- forwards
- swaps
- options sold
- options bought
- other products

To gauge the size of the foreign exchange and derivatives markets, the following types of data were collected:

- turnover in nominal or notional amounts
- outstandings in nominal or notional amounts
- outstandings in gross market values

2. Turnover data

Turnover data provide a measure of market activity, and can also provide a rough proxy for market liquidity. Turnover was defined as the absolute gross value of all new deals entered into during the month of April 2001, and was measured in terms of the nominal or notional amount of the contracts. In addition to foreign exchange spot transactions, turnover data were requested for foreign exchange and interest rate derivatives only.

No distinction was made between sales and purchases (ie a purchase of \$5 million against sterling and a sale of \$7 million against sterling would amount to a gross turnover of \$12 million). Direct cross-currency transactions were counted as single transactions; however, cross-currency transactions passing through a vehicle currency were recorded as two separate deals against the vehicle currency. The gross amount of each transaction was recorded once, and netting arrangements and offsets were ignored. For turnover of transactions with variable nominal or notional principal amounts, the nominal or notional principal amount on the transaction date was reported.

The basis for reporting was the location of the office where any given deal was struck, even if deals entered into in different locations were booked in a central location. Thus, transactions concluded by offices located abroad were not reported by the country of location of the head office, but by that of the office abroad (insofar as the latter was a reporting institution in one of the other

47 reporting countries). In addition, reporting institutions were asked to include in their reporting all arm's length market transactions, ie all transactions in which the dealer is indifferent as to the counterparty. In other words, in-house deals and deals with other offices of the same institution had to be included if the trader was equally willing to conclude the deal in question with a fully independent market participant.

In all cases, transactions were reported to the BIS in US dollar equivalents, with non-dollar amounts generally converted into US dollars using the exchange rate prevailing on the date of the trade.

As in the previous triennial foreign exchange market surveys, turnover data were collected over a one-month period in order to reduce the likelihood that very short-term variations in activity might contaminate the data. The data collected for the survey reflected all transactions entered into during the calendar month of April 2001, regardless of whether delivery or settlement was made during that month.

In order to allow a comparison across countries, daily averages of turnover were computed by dividing aggregate monthly turnover for the country in question by the number of days in April on which the foreign exchange and derivatives markets in that country were open. The number of trading days ranged from 17 to 24.

Turnover in April 2001 was reduced by the fact that Easter fell during the month of the survey. The length of the Easter holiday varied from centre to centre, and even though a given market may have been open, trading, particularly cross-border trading, is likely to have been curtailed by the inability to conclude transactions with dealers in markets which were closed. No other exceptional events were reported to have affected trading in the month of April 2001.

3. Nominal or notional amounts outstanding

Nominal or notional amounts outstanding provide a measure of market size, and can also provide a rough proxy for the potential transfer of price risk in derivatives markets. They are also comparable to measures of market size in related underlying cash markets and shed useful light on the relative size and growth of cash and derivatives markets.

Nominal or notional amounts outstanding were defined as the absolute gross nominal or notional value of all deals concluded and still open at end-June 2001; the date of end-June was chosen to provide consistency with the semiannual OTC derivatives market statistics for the G10 countries.

As in the case of the turnover data, no distinction was made between sales and purchases of derivative instruments and the resulting claims and liabilities of open contracts. In the case of foreign exchange swaps, which were concluded as spot/forward transactions, only the unsettled forward part of the deal was reported. If foreign exchange swaps were executed on a forward/forward basis, amounts outstanding were to be reported separately for both legs. For other forward contracts and swaps, the transactions were always to be reported as one transaction only. For transactions with variable nominal

or notional principal amounts, nominal or notional principal amounts at the reporting date were to be provided.

In contrast to turnover data, the basis for reporting of nominal and notional amounts outstanding was the global book of the head office and all branches and (majority-owned) subsidiaries of a given institution. All these positions had to be added together and reported by the parent institution only to the monetary institution in the country where the parent institution had its head office. In addition, all positions had to be reported on a worldwide consolidated basis, ie all in-house deals and deals with other domestic and foreign offices of the same institution had to be netted out.

In all cases, amounts outstanding were reported to the BIS in US dollar equivalents, with non-dollar amounts converted into US dollars using end-of-period exchange rates.

4. Gross market values

Another measure of the size of derivatives markets is provided by outstandings in terms of gross market values. In addition, gross market values supply information about the scale of gross transfer of price risks in the derivatives markets. Furthermore, gross market values at current market prices provide a measure of market size and economic significance that is readily comparable across derivatives markets and products.

Gross market values were defined as the costs that would have been incurred if the contracts had been replaced at market prices prevailing at 30 June 2001. Reporters were requested to provide both gross positive and gross negative market values in order to permit calculation of aggregate gross market values. Thus, the gross positive market value of a firm's outstanding contracts was defined as the sum of the replacement values of all contracts that are in a current gain position to the reporter at current market prices (and which therefore represent claims on counterparties). The gross negative market value was defined as the sum of the values of all contracts that have a negative value on the reporting date (ie that are in a current loss position and which therefore represent liabilities of the firm to its counterparties).

The term "gross" was used to indicate that contracts with positive and negative replacement values with the same counterparty should not be netted. Nor should the sums of positive and negative contract values within a risk category such as foreign exchange, interest rate, equity, commodity, credit and "other" be set off against each other.

As in the case of nominal or notional amounts outstanding, the basis for reporting of gross positive and negative market values was the global book of the head office and all branches and (majority-owned) subsidiaries of a given institution. All these positions had to be added together and reported by the parent institution only to the monetary authority in the country where the parent institution had its head office. In addition, all positions had to be reported on a worldwide consolidated basis, ie all in-house deals and deals with other domestic and foreign offices of the same institution had to be netted out.

In all cases, gross market values were reported to the BIS in US dollar equivalents, with non-dollar amounts converted into US dollars using end-of-period exchange rates.

5. Market risk categories

As described above, individual derivatives transactions were divided into six market categories: foreign exchange, single currency interest rate, equity, commodity, credit and "other". If individual derivatives transactions involved more than one market category, transactions that were simple combinations of exposures were to be reported separately in terms of their individual components. Transactions that could not be readily decomposed into separable market risk components were to be reported in only one market risk category. The allocation of such products with multiple exposures had to be determined by the most significant underlying risk component. However, if reporting institutions were in doubt about the correct classification of multi-exposure derivatives, they were asked, for practical reasons, to allocate the deals according to the following order of precedence:

Commodities. All derivatives transactions involving a commodity or commodity index exposure, whether they involved a joint exposure to commodities or any other market risk category (ie foreign exchange, interest rate or equity), had to be reported in the commodity category.

Equities. With the exception of contracts with a joint exposure to commodities and equity, which were to be reported as commodities, all derivatives transactions with a link to the performance of equities or equity indices had to be reported in the equity category. That is, equity deals with exposure to foreign exchange or interest rates had to be included in this category. For instance, quanto-type instruments with joint equity and foreign currency exposures had to be reported in the equity category.

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

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

6. Instrument definitions and categorisation

In each market risk category, derivatives were broken down by three types of plain vanilla instrument (forwards, swaps and options). Plain vanilla instruments were defined as instruments which are traded in generally liquid markets according to more or less standardised contracts and market conventions. If a transaction was composed of several plain vanilla components, each part was in principle to be reported separately.

In addition, there was a separate category for other products. This category mainly included transactions with a variable notional principal amount or contract features which act to multiply leverage. Furthermore, deals where a decomposition into individual plain vanilla components was impractical or impossible were also classified as other products.

The following provides an overview of the individual market risk categories and instruments covered in the survey:

6.1 *Foreign exchange spot and derivatives transactions*

Spot transaction	Single outright transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) within two business days. The spot legs of swaps were not included among spot transactions but were treated as swap transactions even when they were for settlement within two days (ie including “tomorrow/next day” transactions).
Outright forward	Transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) at some time in the future (more than two business days later).
Foreign exchange swap	Transaction which involves the actual exchange of two currencies (principal amount only) on a specific date at a rate agreed at the time of conclusion of the contract (the short leg), and a reverse exchange of the same two currencies at a date further in the future at a rate (generally different from the rate applied to the short leg) agreed at the time of the contract (the long leg). Both spot/forward and forward/forward swaps are included. Short-term swaps carried out as “tomorrow/next day” transactions are also included in this category.
Currency swap including cross-currency swap	Contract which commits two counterparties to exchange streams of interest payments in different currencies for an agreed period of time and to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity.
Currency option/warrant	Option contract that gives the right to buy or sell a currency with another currency at a specified exchange rate during a specified period. This category also includes exotic foreign exchange options such as average rate options and barrier options.
Currency swaption	Option to enter into a currency swap contract.

The options section took precedence in the instrument classification, so that any foreign exchange derivative product with an embedded option was to be reported as an option. All other foreign exchange derivative products were in principle to be reported in the forwards or swaps section. However, foreign exchange derivative instruments which involved several features and where a decomposition into individual plain vanilla components was impractical or impossible, such as swaps with underlying notional principal in one currency and fixed or floating interest rate payments based on interest rates in currencies other than the notional (differential swaps or diff swaps), were to be allocated to the residual category of “other” foreign exchange products.

6.2 *Single currency interest rate derivatives*

Forward rate agreement (FRA)	Interest rate forward contract in which the rate to be paid or received on a specific obligation for a set period of time, beginning at some time in the future, is determined at contract initiation.
Interest rate swap	Agreement to exchange periodic payments related to interest rates on a single currency; can be fixed for floating, or floating for floating based on different indices. This group includes those swaps whose notional principal is amortised according to a fixed schedule independent of interest rates.
Interest rate option/warrant	Option contract that gives the right to pay or receive a specific interest rate on a predetermined principal for a set period of time.
Interest rate cap	Option that pays the difference between a floating interest rate and the cap rate.
Interest rate floor	Option that pays the difference between the floor rate and a floating interest rate.
Interest rate collar	Combination of cap and floor.
Interest rate corridor	1) A combination of two caps, one purchased by a borrower at a set strike and the other sold by the borrower at a higher strike to, in effect, offset part of the premium of the first cap. 2) A collar on a swap created with two swaptions – the structure and participation interval is determined by the strikes and types of the swaptions. 3) A digital knockout option with two barriers bracketing the current level of a long-term interest rate.
Interest rate swaption	Option to enter into an interest rate swap contract, purchasing the right to pay or receive a certain fixed rate.

The options section took precedence in the instrument classification, so that any interest rate derivative product with an embedded option was to be reported as an option. All other interest rate derivative products were to be reported in the forwards or swaps section. However, interest rate derivative instruments with leveraged payoffs and/or those whose notional principal varies as a function of interest rates, such as swaps based on Libor squared as well as index-amortising rate swaps, were to be allocated to the residual category of “other” interest rate products.

6.3 *Equity and stock index derivatives*

Equity forward	Contract to exchange an equity or equity basket at a set price at a future date.
Equity swap	Contract in which one or both payments are linked to the performance of equities or an equity index (eg S&P 500). It involves the exchange of one equity or equity index return for another, or the exchange of an equity or equity index return for a floating or fixed interest rate.
Equity option/warrant	Option contract that gives the right to deliver or receive a specific equity or equity basket at an agreed price at an agreed time in the future.

The equity section did not have an “other” derivative product section; other equity products therefore had to be reported in either the options or the forwards and swaps section. The options section took precedence in the instrument classification, so that any equity derivative product with an embedded option was to be reported as an option. All other equity derivative products were to be reported in the forwards and swaps section.

6.4 *Commodity derivatives*

Commodity forward	Forward contract to exchange a commodity or commodity index at a set price at a future date.
Commodity swap	Contract with one or both payments linked to the performance of a commodity price or a commodity index. It involves the exchange of the return on one commodity or commodity index for another, or the exchange of a commodity or commodity index for a floating or fixed interest rate.
Commodity option	Option contract that gives the right to deliver or receive a specific commodity or commodity index at an agreed price at a set date in the future.

The commodity section did not have an “other” derivative product section; other commodity products therefore had to be reported in either the options or the forwards and swaps section. The options section took precedence in the instrument classification, so that any commodity derivative product with an embedded option was to be reported as an option. All other commodity derivative products were to be reported in the forwards and swaps section.

6.5 *Credit derivatives*

Credit spread forward	Agreement to pay or receive at some time in the future a cash payment which depends on the difference between a spread (ie the difference in yields between two financial assets) agreed at contract initiation and that prevailing at settlement.
Credit event/default swap	Contract which commits two counterparties to exchange a periodic fee in exchange for a payment contingent on a default event or any other agreed change in the credit quality of a reference asset for an agreed period of time.
Total return swap	Contract which commits two counterparties to exchange the total economic performance of a financial asset (defined to include all interest payments and fees plus any capital appreciation or depreciation) in exchange for a floating rate payout based on a reference index (usually Libor plus a spread reflecting the creditworthiness of the counterparty as well as the credit rating and liquidity of the underlying asset).
Credit spread option	Option contract that gives the right to receive a cash payment if a spread, ie the difference in yields between two financial assets, widens beyond an agreed strike level during a specific period.

7. Counterparties

Following the methodology of the previous triennial central bank surveys, reporting institutions were requested to provide for each instrument in the foreign exchange, interest rate, equity, credit and “other” derivatives risk categories a breakdown of contracts by counterparty as follows: reporting dealers, other financial institutions and non-financial customers. In the *turnover* part of the survey, reporters were requested to provide separate information on local and cross-border transactions. The distinction between local and cross-border had to be determined according to the location of the counterparty and not its nationality.

In the *turnover* part of the survey, “reporting dealers” were defined as those institutions either in the same country or in another country *which participated in the coordinated survey*. In the *amounts outstanding* part of the survey, “reporting dealers” were defined as those either in the same country or another country *which contribute to the regular derivatives market statistics (and which include their consolidated subsidiaries that are active in derivatives markets)*; in both parts of the survey, “reporting dealers” are mainly commercial and investment banks and securities houses, including their branches and subsidiaries, which play a role as market-makers or intermediaries, and other entities which are active dealers. A full list of individual “reporting dealers” was provided by the BIS through the participating monetary authorities to all reporting institutions.

The reasons for not including all reporting institutions in the category of “reporting dealers” in the *amounts outstanding* part of the survey were to ensure consistency with the regular derivatives market statistics and to limit the reporting burden for regular reporters. While this approach makes it difficult to accurately eliminate double-counting of trades between non-regular reporters (see below), the amounts involved were believed to be small.

“Other financial institutions” were defined as all categories of financial institution *not* classified as “reporting dealers”, including banks, funds and non-bank financial institutions which may be considered as financial end-users (eg mutual funds, pension funds, hedge funds, currency funds, money market funds, building societies, leasing companies, insurance companies, central banks).

A “non-financial customer” was any counterparty other than those described above, in practice mainly corporate firms and governments.

8. Currency and other market risk breakdowns

In order to obtain consistent data on turnover in principal currency segments of the foreign exchange market, reporting institutions were asked to report turnover data on foreign exchange contracts in principle with a similar breakdown by currency pairs to that in the previous surveys. As a result, data were provided separately for trading in domestic currency, US dollars and euros against each other and against the following currencies:

Japanese yen, pound sterling, Swiss franc, Canadian dollar, Australian dollar and other currencies.

Given the increasing interest in and importance of a number of other, in particular emerging market, currencies, reporting dealers were requested to provide supplementary information on total turnover for the following currencies, which also had to be included in the above columns for "other" currencies in the breakdown by currency pairs:

Brazilian real, Chinese renminbi, Czech koruna, Danish krone, Hong Kong dollar, Hungarian forint, Indian rupee, Indonesian rupiah, Korean won, Mexican peso, New Zealand dollar, Norwegian krone, Philippine peso, Polish zloty, Russian rouble, Singapore dollar, South African rand, Swedish krona, new Taiwan dollar, Thai bath and Turkish lira.

For *turnover* of single currency interest rate contracts the previous currency breakdown was also expanded to reflect the growing importance of other, in particular emerging market, currencies. In addition to:

domestic currency, Australian dollar, Canadian dollar, euro, Japanese yen, pound sterling, Swiss franc and US dollar,

the currency breakdown also included the following currencies:

Danish krone, Hong Kong dollar, Indonesian rupiah, Mexican peso, New Zealand dollar, Norwegian krone, Singapore dollar, Swedish krona and Thai bath.

For *amounts outstanding* of foreign exchange and interest rate contracts, the following currency breakdown was requested:

US dollar, euro, Japanese yen, pound sterling, Swiss franc and other currencies.

In addition, reporting institutions were asked to identify amounts for individual other currencies if they had a material amount of outstanding contracts in those currencies, for example if a notional amount outstanding in a currency for a given instrument was greater than 2% of the total notional amount outstanding for that instrument. However, participating central banks had discretion in defining a "material" amount for reporting of individual other currencies.

In contrast to the turnover part of the survey, amounts outstanding of foreign exchange contracts were broken down on a single currency basis. This means that the notional amount outstanding and the gross positive or negative market value of each contract were reported twice, according to the currencies making up the two "legs" of the contract. The total of the amounts reported for individual currencies thus adds up to 200% of total contracts outstanding, while total reported contracts represent only half of the sum of the individual currency components. For example, a reporting institution entering into a forward contract to purchase US dollars in exchange for euros with a notional principal amount of \$100 million reported \$100 million in the US dollar column, another \$100 million in the euro column, and also \$100 million in the "Total" column.

Notional amounts outstanding of equity and stock index derivatives were categorised according to whether they related to US, Japanese, European

(excluding countries in eastern Europe), Latin American, other Asian or other countries' equity and stock indices. The contracts had to be allocated according to the nationality of the issuer of the underlying rather than the country where the instrument is being traded. Commodities had to be broken down into gold, other precious metals and "other" commodities. For credit and "other" derivatives, no further breakdown by risk factor was required.

9. Maturities

In the *turnover* part of the survey, transactions in outright forwards and foreign exchange swaps were to be broken down between the following maturity bands:

- seven days or less
- over seven days and up to one year
- over one year

For *amounts outstanding* of foreign exchange, interest rate and equity-linked contracts, a breakdown was requested by residual maturity between the following bands:

- one year or less
- over one year and up to five years
- over five years

In the case of transactions where the first leg had not fallen due, the residual maturity had to be determined by the difference between the near- and far-end dates of the transaction and not by the date of conclusion of the deal.

10. Elimination of double-counting

Double-counting arises because transactions and positions between two reporting entities are recorded by each of them, ie twice. In order to derive meaningful measures of overall market size, it is therefore necessary to halve the data on transactions and positions between reporting dealers. To enable this, reporters were asked to distinguish deals contracted with other reporters (dealers). The following methods of adjustment were applied for three types of data: foreign exchange and derivatives turnover, notional amounts outstanding and gross market values of derivatives positions.

In the case of *turnover and, in 1995, notional amounts outstanding*, for which data were collected on a locational basis separately for local and cross-border deals, reported data on local deals with other reporters were firstly divided by two and this figure was subtracted from total reported gross data to arrive at so-called "net-gross" figures, ie business net of local inter-dealer double-counting. In a second step, reported data on cross-border deals with other reporters were also divided by two and this figure was subtracted from total reported "net-gross" data to obtain so-called "net-net" figures, ie business net of local and cross-border inter-dealer double-counting.

The adjustments for *gross market values in 1995* were performed as follows: in a first step, to obtain data on a "net-gross" basis, ie net of local inter-dealer double-counting, gross positive and negative market values of contracts

held by reporting institutions were added to each other and the gross negative market value of their local contracts with other reporting dealers was subtracted from the resulting aggregate. In a second step, the gross negative market value of their cross-border contracts with other reporting dealers was subtracted from the “net-gross” data, to arrive at “net-net” figures, ie gross market values net of local and cross-border double-counting.

In the case of *notional amounts outstanding in 1998 and 2001*, for which data were collected on a worldwide consolidated basis without distinction between local and cross-border deals, reported deals with other reporters were divided by two and this figure was subtracted from total reported “gross-gross” data to immediately obtain “net-net” figures, ie business net of any inter-dealer double-counting. For commodity contracts, for which no counterparty breakdown was collected in 1998 and 2001, the adjustments for double-counting were estimated using the results of the 1995 survey.

In the case of *gross market values in 1998 and 2001*, for which data were also collected on a worldwide consolidated basis without distinction between local and cross-border deals, the adjustments for double-counting were performed as follows: in a first step, gross positive and negative market values of contracts held by reporting institutions were added to each other to obtain data on a “gross-gross” basis. In a second step, the gross negative market value of contracts with other reporting dealers was subtracted from the “gross-gross” data to immediately arrive at “net-net” figures. For gross market values reported by non-regular reporting institutions, ie dealers which do not participate in the semi-annual OTC derivatives market statistics of major dealers in the G10 countries, the adjustments for double-counting were assumed to be proportionate to those of the regular reporting institutions. For commodity contracts, for which no counterparty breakdown was collected in 1998 and 2001, the adjustments for double-counting were estimated using the results of the 1995 survey. For credit-linked and “other” OTC contracts, for which data were collected without any counterparty breakdown, no adjustments were made for double-counting.

Measures of global foreign exchange market activity					
Daily averages in April, in billions of US dollars					
	1989	1992	1995	1998	2001
Total reported gross turnover	907	1,293	1,864	2,337	1,863
Adjustment for local double-counting	-189	-217	-292	-368	-245
Total reported turnover net of local double-counting ('net-gross')	718	1,076	1,572	1,969	1,618
Adjustment for cross-border double-counting	-184	-300	-435	-540	-445
Total reported “net-net” turnover	534	776	1,137	1,429	1,173
<i>of which: cross-border transactions</i>	...	392	611	772	674
Estimated gaps in reporting	56	44	53	60	26
Estimated global turnover	590	820	1,190	1,490	1,200

Table D.1

11. Gaps in reporting

Gaps in reporting stem from two sources: incomplete reporting (ie deals between two non-reporters) in the countries providing data, and less than full coverage of the range of countries in which the surveyed activity takes place. The second type of gap is mitigated by the existence of counterparty reports. The bulk of the cross-border inter-dealer business of dealers located in non-reporting countries is very likely to be captured in the reports of their counterparties in countries participating in the survey. The types of transactions which are not included in the reported data are local as well as cross-border transactions between dealers in non-reporting countries, and those between non reporting dealers and any customers or other financial institutions wherever they are located.

In the most recent as well as previous surveys, an attempt was made to estimate both gaps for turnover in traditional foreign exchange instruments, ie spot transactions, outright forwards and foreign exchange swaps (Table D.1). The basis for estimating gaps due to incomplete reporting in the countries providing the data was information supplied on the coverage of the survey in each participating country (Table B.8). For example, if in a given country the coverage of the survey as compared to total market activity was 90%, the gap from incomplete reporting was estimated to represent 10% of reported turnover and amounts outstanding in that country.

In the 1998 and 2001 surveys, gaps from incomplete reporting in the countries providing data were estimated for turnover of derivative instruments, but not for notional amounts outstanding and gross market values because it can be assumed that the coverage for the last two types of data was almost complete due to the worldwide consolidated reporting of all major dealers in the participating 43 and 48 countries respectively, and because of the lack of any information on missing coverage.

In some cases, the sum of sub-items does not equal the total for the category in question. Apart from rounding, this can result from incomplete classification of data, use of residual categories and suppression of data for confidentiality reasons.

12. Intertemporal comparisons

Intertemporal comparisons are complicated by changes in coverage and definition and the movement of exchange rates over the three-year periods separating the surveys in the participating countries.

Changes in coverage have been of two kinds. Firstly, within national markets the coverage of dealers active in national markets has changed. An increase in the number of reporting institutions does not, however, necessarily denote greater coverage. If institutions which were not active before, and were therefore not covered in earlier reports, began to deal on a substantial scale, it is legitimate to compare the total turnover of the larger number of reporting institutions with the total turnover of the smaller number reporting their transactions in the previous period. The same applies, of course, in the case of

a decrease in the number of reporting institutions due to a reduction of their activity and importance in the market.

The second type of change in coverage relates to the inclusion of a larger number of countries. In 1986 only four countries participated in the triennial foreign exchange turnover survey. In 1989 the number rose to 21, but some of them did not provide all types of information. In 1992 a total of 26 countries, including all countries with important markets, reported comprehensive data on turnover in foreign exchange transactions. In 1995 the number of countries did not increase further, but the coverage of market activity was significantly expanded to include all financial derivatives and to collect data not only on turnover, but on notional amounts outstanding and gross market values as well. In 1998 the number of reporting countries increased to 43 and the coverage of derivatives market activity was further expanded to include separate data on credit-linked derivatives. Finally, in 2001 the number of reporting countries increased further to 48 while the coverage of market segments remained the same as in 1998.

While the additional information provided by new reporting countries is valuable, not all of it relates to transactions that were not captured before. The bulk of these countries' cross-border transactions with dealers can be presumed to have been included in the reports of their counterparties in earlier years. In new reporting countries, the business not captured before therefore relates to local inter-dealer transactions and those with non-reporting financial institutions and customers.

Another complication involves changes in definitions. Most changes in definition reflect improvements in compilation procedures. In particular, greater effort has been made since the 1992 survey to classify counterparties accurately and a finer counterparty breakdown has been used. As a result, it is now possible to arrive at more accurate estimates of double-counting and to compile net figures on turnover for all items. However, because this was not possible in earlier years, intertemporal comparisons contain some double-counting. This procedure introduces biases to the extent that the share of inter-dealer business has changed over time. In addition, in 1998 the reporting basis for the amounts outstanding part of the survey was changed substantially as data were collected on a worldwide consolidated basis, as compared to a locational unconsolidated basis in 1995. However, in order to facilitate the comparison between the 1995 and 1998 survey results, reporting institutions were required to provide separate data on contracts with own branches and subsidiaries in 1998.

13. Data at constant exchange rates

Another question often raised with intertemporal comparisons is about the impact on aggregate turnover and amounts outstanding of movements in exchange rates vis-à-vis the US dollar from one reporting date to the next. For example, turnover in the Japanese yen/pound sterling sector may have remained unchanged from one reporting period to the next in terms of these currencies. But if the dollar rises against both currencies, total turnover in the

segment reported in dollar terms will be lower, thus signalling a decline where none has in fact taken place. Even in currency pairs involving the dollar, exchange rate movements will impact turnover. For example, if a trade for a fixed amount of yen against US dollars is transacted, the trade will enter the aggregates with a smaller or larger US dollar amount, depending on how the yen moves against the dollar from one reporting date to the next. A yen-based observer would note spurious movements in the yen aggregates reported in dollar terms.

To provide some guidance on the impact of actual exchange rate movements on total reported aggregates, a few of the major pre-2001 aggregates have been provided additionally recalculated at constant exchange rates, replacing historical exchange rates by average April or end-June 2001 exchange rates (Tables B.1, C.1, C.2 and C.5). All transactions in a given currency, say the yen, are converted into original currency terms at the historical exchange rate and then recalculated using the average April 2001 or end-June 2001 dollar/yen exchange rate, as appropriate. In case of foreign exchange transactions, the dollar side of transactions remains unchanged, since the exchange rate for dollar amounts is constant (and equal to one) over time. The sums of all recalculated transactions are divided by two. This takes account of the joint contribution of two currencies to each foreign exchange transaction.

14. Annex tables

The detailed aggregated results of the Central Bank Survey of Foreign Exchange and Derivatives Market Activity in April and at end-June 2001 and the semiannual derivatives market statistics in the G10 countries at end-June 2001 are presented in the following Annex tables in two separate sections: the first covering foreign exchange markets, ie turnover in traditional foreign exchange business, such as spot, outright forward and foreign exchange swap deals, and the second comprising OTC derivatives markets, ie turnover, notional amounts outstanding and gross market values of foreign exchange, interest rate, equity, commodity, credit-linked and other derivatives. There is an overlap between the two sections as the second section on OTC derivatives turnover includes data on outright forwards and foreign exchange swaps which are also covered in the first section on turnover in foreign exchange markets.

14.1 *Foreign exchange markets*

Tables E.1 to E.3 show total reported foreign exchange market turnover net of both local and cross border double-counting by market segment, counterparty and currency. No adjustments were made for gaps in reporting in these or any other Annex tables. Because of less than full coverage in national markets, the adjustment for local inter-dealer double-counting may be slightly exaggerated.

Because two currencies figure in every transaction, the sum of transactions in all individual currencies shown in Table E.1 equals twice the total transactions shown in the first column. Information by currency pair is

shown for the US dollar in Table E.2, and for the euro in Table E.3. Because the data in these latter tables relate to currency pairs, the sum of all transactions equals the total for the currency in question, not twice that total. The totals for the currencies in Tables E.2 and E.3 therefore correspond to the figures in the second and third columns of Table E.1.

The information on currencies relates only to separately reported transactions. If transactions in a given currency were not identified separately, but placed in one of the residuals (currencies of other reporting countries or other currencies), global turnover in that currency is understated. For the major currencies, the amount of underestimation from this source can be presumed to be minimal.

The data on transactions in “currencies of other reporting countries” relate to transactions in the domestic currencies of those reporting countries whose currencies are not shown separately. The residual contains transactions in currencies of other reporting countries if both counterparties to the deal are resident outside the country of the currency of issue, all transactions in currencies of countries outside the reporting area and all other unidentified transactions.

Tables E.4 to E.7 provide information on reported foreign exchange market turnover by country and currency net of local inter-dealer double-counting. No adjustment was made for cross-border double-counting or for gaps in reporting. The totals at the foot of these tables are the sum of the items in the columns in question. They do not correspond to those in Tables E.1 to E.3 because of the absence of an adjustment for cross-border double-counting. As in Table E.1, the sum of transactions in each individual currency in Table E.4 equals twice the total transactions because two currencies figure in every deal. Because the data in Tables E.5 to E.7 relate to currency pairs, the total for all transactions sums to the total for the currency, not to twice the total.

Tables E.8 to E.13 contain information on reported foreign exchange market turnover by country, counterparty and market segment, and on the maturity breakdown of reported outright forward and foreign exchange swap transactions by country net of local double-counting. No adjustment was made for cross-border double-counting.

Tables E.14 to E.15 contain information on the maturity breakdown of reported outright forward and foreign exchange swaps transactions by currency net of local and cross-border double-counting.

Tables E.16 to E.19 provide an intertemporal comparison of reported foreign exchange turnover net of local double-counting by country and *market segment*.

14.2 *Derivatives markets*

Tables E.20 to E.29 provide information on reported turnover of foreign exchange derivatives by instrument, counterparty and currency, by country and currency, and by country, counterparty and instrument. The data broken down by instrument are calculated net of both local and cross-border double-

counting. The data broken down by country are adjusted for local dealer double-counting only.

Tables E.30 to E.35 contain detailed data on reported turnover of single currency interest rate derivatives by instrument, counterparty and currency, by country and currency, and by country, counterparty and instrument. The data broken down by instrument are calculated net of both local and cross-border double-counting. The data broken down by country are adjusted for local dealer double-counting only.

Tables E.36 to E.37 provide an intertemporal comparison of reported foreign exchange and single currency interest rate derivatives turnover net of local double-counting by country and derivative instrument.

Tables E.38 to E.41 contain detailed data on reported *notional amounts outstanding* of foreign exchange, single currency interest rate, equity, commodity, credit and other derivatives broken down by instrument, counterparty and market risk factor (ie mainly by currency). The data are adjusted for inter-dealer double-counting.

Tables E.42 to E.45 contain detailed data on reported *gross positive and negative market values* of foreign exchange, single currency interest rate, equity, commodity, credit and other derivatives by instrument, counterparty and market risk factor (ie mainly currency). The data are not adjusted for inter-dealer double-counting.

Tables E.46 to E.48 provide information on the maturity breakdown of notional amounts outstanding of foreign exchange, single currency interest rate and equity-linked derivatives by instrument and counterparty. The data are adjusted for inter-dealer double-counting.

Tables E.49 to E.51 provide an intertemporal comparison of reported notional amounts outstanding and gross market values of foreign exchange, single currency interest rate and equity-linked derivatives by instrument and counterparty. The data are adjusted for inter-dealer double-counting.