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Singapore:	Monetary Authority of Singapore	(+65) 229-9668
South Africa:	South African Reserve Bank	(+27 12) 313-3641
South Korea:	The Bank of Korea	(+82 2) 759-5739
Spain:	Banco de España	(+34 91) 338-5000
Sweden:	Sveriges Riksbank	(+46 8) 787-0721
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Contents

A. Summary of Main Findings

The geographical coverage of the triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity was further expanded in 1998 (from 26 countries in 1995 to 43 countries). At the same time, in order to reduce the reporting burden, a few changes were introduced in the coverage of derivatives. Thus, since exchange-traded business is regularly collected by the BIS from the exchanges themselves, the reporting framework was limited to over-the-counter markets. In addition, information pertaining to amounts outstanding differed from the preceding survey both in the reporting date (end-June rather than end-March) and in the reporting basis (worldwide consolidation versus location of reporters). These changes were made to ensure consistency with the new regular consolidated derivatives market statistics in the G10 countries, which were introduced at end-June 1998. [1]

The results of the latest triennial survey should be put in the context of the financial environment prevailing in 1998. In particular, sharp swings in global market sentiment were recorded between the first and second halves of the year. Whereas the earlier period represented the final phase of a long and significant build-up of positions in a broadening range of market segments, the Russian crisis in the summer precipitated an unprecedented wave of unwinding of positions, especially in foreign exchange and fixed income markets. In addition, the run-up to the single European currency was associated with various strategies, tending in the main to boost transactions in the earlier part of the year (namely before the announcement concerning the initial participants in European monetary union at the beginning of May), whereas greater caution prevailed in the period immediately preceding the introduction of the euro on 1 January 1999. The disappearance of a number of currencies and their replacement by the euro will have also considerably modified the configuration of markets and related trading strategies. The new regular reporting of consolidated derivatives market statistics will therefore act as an important complement to the present triennial survey in assessing the evolution of risk exposure and management over time.

1. Foreign exchange market turnover

In terms of notional principal amounts, global turnover in traditional foreign exchange market segments (spot transactions, outright forwards and foreign exchange swaps) reached an estimated daily average of $1.5 trillion in April 1998. This represented growth of 26% in the three-year period since April 1995, an apparent sharp slowdown from the 45% rate of expansion of the 1992-95 triennium. However, adjusted for differences in the dollar value of non-dollar transactions, growth accelerated between the two periods, from 29% to 46%. Forward instruments (outright forwards and forex swaps) consolidated their dominant position, with a market share of 60% (up from 56% in April 1995). At the same time, the market continued to be dominated by inter-dealer business (63%) and cross-border transactions (54%).

2. OTC derivatives market activity

(a) Global daily *turnover* in foreign exchange and interest rate derivatives contracts traded over-the-counter (OTC), including traditional forex derivatives instruments, was estimated at $1.3 trillion in April 1998. In constant dollar terms, this represented growth of 66% since April 1995. Foreign exchange activity continued to outweigh by a wide margin that in interest rate products. The high turnover reported for the former owes much to the very short-term nature of most contracts. This contrasts with the longer duration of the majority of interest rate contracts (swaps in particular) and also, therefore, with the actual exposures associated with these two categories of risk (see below).

[1] See the BIS Press Release of 22nd December 1998: "The Global OTC Derivatives Market at end-June 1998".

Table A-1

Foreign exchange market turnover[1]

Daily averages in billions of US dollars

Category	April 1989	April 1992	April 1995	April 1998
Spot transactions[2]	350	400	520	600
Outright forwards and forex swaps[2]	240	420	670	900
Total "traditional" turnover	**590**	**820**	**1,190**	**1,500**
Memorandum item:				
Turnover at April 1998 exchange rates	*600*	*800*	*1,030*	*1,500*

[1] Adjusted for local and cross-border double-counting. [2] Including estimates for gaps in reporting.

Table A-2

OTC derivatives market turnover[1]

Daily averages in billions of US dollars

Category	April 1995	April 1998
Foreign exchange turnover	**688**	**961**
Outright forwards and forex swaps	643	864
Currency swaps	4	10
Options	41	87
Other	1	0
Interest rate turnover	**151**	**265**
FRAs	66	74
Swaps	63	155
Options	21	36
Other	2	0
Total derivatives turnover[2]	**880**	**1,265**
Memorandum items:		
Turnover at April 1998 exchange rates	*764*	*1,265*
Exchange-traded derivatives[3]	*1,222*	*1,373*
Currency contracts	*17*	*12*
Interest rate contracts	*1,205*	*1,361*

[1] Adjusted for local and cross-border double-counting. [2] Including estimates for gaps in reporting. [3] Sources: 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 and 20.5 trading days in 1998.

Table A-3

OTC derivatives market positions[1]

In billions of US dollars

Notional amounts outstanding

Category	End-March 1995	End-June 1998
Foreign exchange contracts	**13,095**	**22,055**
Outright forwards and forex swaps	8,699	14,658
Currency swaps	1,957	2,324
Options	2,379	5,040
Other	61	33
Interest rate contracts	**26,645**	**48,124**
FRAs	4,597	6,602
Swaps	18,283	32,942
Options	3,548	8,528
Other	216	52
Other contracts[2] and gaps in reporting	**7,790**	**1,964**
Total derivatives contracts	**47,530**	**72,143**
Memorandum items:		
Total contracts at end-June 1998 exchange rates	*43,231*	*72,143*
Positions vis-à-vis own affiliates	..	*25,754*
Exchange-traded derivatives[3]	*10,310*	*14,256*
Currency contracts	*119*	*103*
Interest rate contracts	*9,722*	*13,107*
Equity index contracts	*469*	*1,047*

Gross market values

Category	End-March 1995	End-June 1998
Foreign exchange contracts	**1,048**	**982**
Outright forwards and forex swaps	622	584
Currency swaps	346	255
Options	71	141
Other	10	2
Interest rate contracts	**647**	**1,356**
FRAs	18	39
Swaps	562	1,189
Options	60	126
Other	7	2
Other contracts[2] and gaps in reporting	**510**	**247**
Total derivatives contracts	**2,205**	**2,585**
Memorandum item:		
Total contracts at end-June 1998 exchange rates	*2,044*	*2,585*

[1] Adjusted for inter-dealer double-counting. [2] Equity, commodity, credit and other derivative contracts. [3] Sources: Futures Industry Association; various futures and options exchanges.

(b) A better comparison of market size is provided by *notional amounts outstanding*. At the end of June 1998, global positions in OTC financial derivatives contracts covering all categories of market risk stood at $72 trillion. Adjusting for differences in exchange rates and the change from locational to consolidated reporting, this represented an increase of about 130% since end-March 1995. The most recent data confirmed not only the predominance of OTC over exchange-traded positions but also, within the OTC market, the overwhelming importance of interest rate instruments over exchange rate ones (respectively 67% and 31% of notional amounts). Those based on equities and commodities accounted for only 2% of the total.

(c) Gross market values, which measure the transfer of wealth at current market prices that these contracts entail, stood at $2.6 trillion at the end of June 1998. While this represented 3.6% of the reported total notional amounts, the ratio varied considerably across individual market segments, from less than 1% for FRAs to 15% for equity-linked options. Gross market values exaggerate the derivatives-related credit exposure of reporting institutions, which are largely reduced by netting and collateral arrangements. Such credit exposure stood at $1.2 trillion, or 11% of on-balance-sheet international banking assets.

B. Foreign exchange market activity

1. Coverage of the survey

In April 1998, 43 central banks and monetary authorities participated in the triennial survey of foreign exchange market activity, the fifth such survey since 1986. Seventeen countries participated for the first time and contributed 2.6% to total turnover, indicating that the previous survey had already achieved very comprehensive coverage. In most cases, the coverage was estimated to have reached 90% or more of turnover (Table B-1).

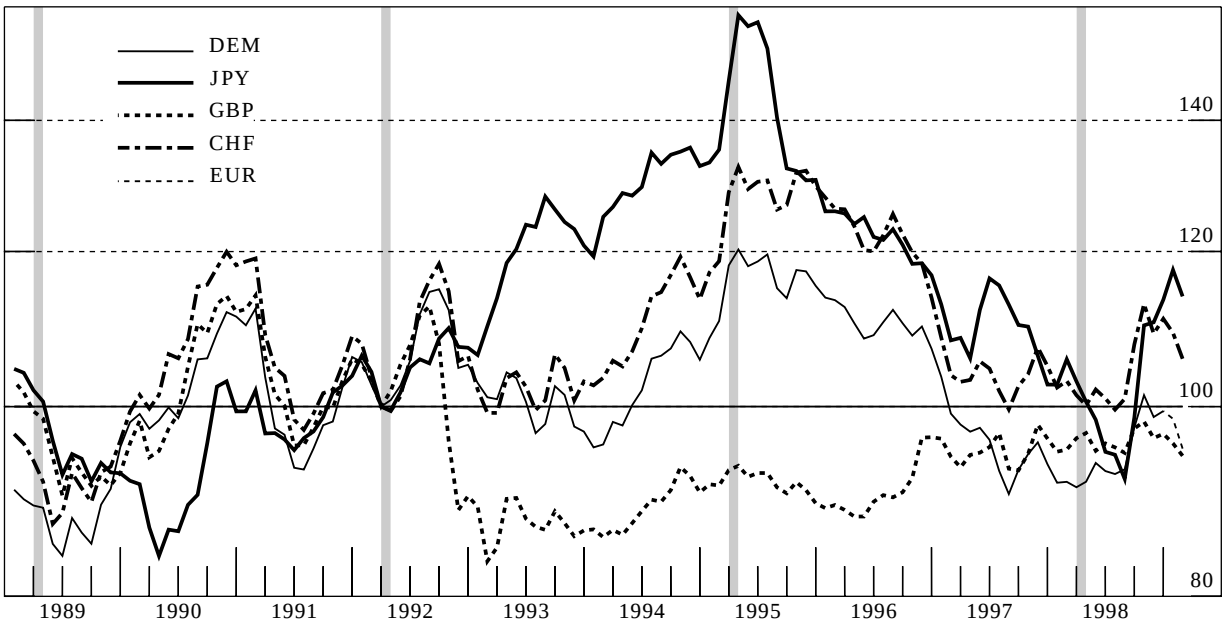
Since the data pertain to only a one-month snapshot of activity, participating countries were asked to gauge how representative the period was. The vast majority of respondents considered turnover to have been normal. Six reported turnover below normal and three above normal. Overall, this pattern of responses was very similar to those in April 1992 and 1995, so that the data can be considered fairly comparable and representative of the underlying trend in foreign exchange market activity.

It is important to bear in mind that currency developments had a significant impact on the data, which are reported in current dollar terms. The Japanese yen had retreated from the heights reached during the previous survey and was again trading at the level prevailing during the April 1992 survey (Graph B-1). With the exception of the pound sterling, other major currencies followed a similar pattern during this six-year period, albeit with smaller fluctuations.

Graph B-1

Bilateral exchange rates with the US dollar

April 1992 = 100, semi-log scale



Note: shaded area designates survey months.

Table B-1

Basic features of the April 1998 foreign exchange market survey

Reporting country	Coverage in percentages	Number of banks covering 75%	Number of participants[1]		Number of trading days	Nature of turnover	
						in April	preceding six months
Argentina	66	21	18	(–)	20	normal	steady
Australia	100	9	66	(75)	23	normal	steady
Austria	91	3	10	(10)	20	normal	steady
Bahrain	90	6	34	(80)	20	normal	normal
Belgium	95	6	30	(46)	20	normal	steady
Brazil					19		
Canada	100	5–7	36	(38)	21	below	increasing
Chile	100	9	28	(–)	21	normal	increasing
China			426	(–)	22	normal	
Czech Republic	95–100	10	26	(–)	10[2]	normal	steady
Denmark	95	3	16	(16)	19	normal	normal
Finland	100	2	13	(17)	20	normal	decreasing
France	90	7	84	(77)	21	normal	increasing
Germany	90	9	57	(80)	20	normal	
Greece	90	8	20	(44)	20	above	steady
Hong Kong	100	26	366	(376)	19	normal	decreasing
Hungary	95	11	39	(–)	21	normal	steady
India	75	20	20	(–)	20	normal	increasing
Indonesia	79	5	25	(–)	19	below	decreasing
Ireland	100	6	70	(21)	20		
Italy	75	11	33	(28)	21	normal	decreasing
Japan	100	19	356	(345)	21	normal	steady
Luxembourg	100	13	215	(223)	21	normal	steady
Malaysia	79	5	5	(–)	20	normal	
Mexico	69		6	(–)	20	normal	increasing
Netherlands	95	3[3]	20	(33)	19	normal	increasing
New Zealand	99	4	6	(8)	20	normal	steady
Norway	100	4	19	(27)	19	below	steady
Philippines	90	10	51	(–)	20	normal	steady
Poland	90	6	20	(–)	21		
Portugal	100	7	44	(40)	21	normal	increasing
Russia	75	15	26	(–)	22	above	decreasing
Saudi Arabia	90–100	5	11	(–)	22	below	steady
Singapore	100	23	206	(218)	20	normal	decreasing
South Africa	97	5	24	(19)	19	above	increasing
South Korea	100	21	99	(–)	22	below	decreasing
Spain	80	8	26	(34)	19	normal	steady
Sweden	90–95	3	4	(5)	20	normal	
Switzerland	90	7	64	(114)	20	normal	steady
Taiwan	100	24	49	(–)	21		
Thailand	85	12	33	(–)	18	below	decreasing
United Kingdom	100	24	293	(313)	20	normal	steady
United States	98	20	93	(130)	21	normal	steady

[1] Number of reporting institutions in 1995 in brackets. [2] Length of monitoring period. [3] Coverage of 90%

2. Global turnover

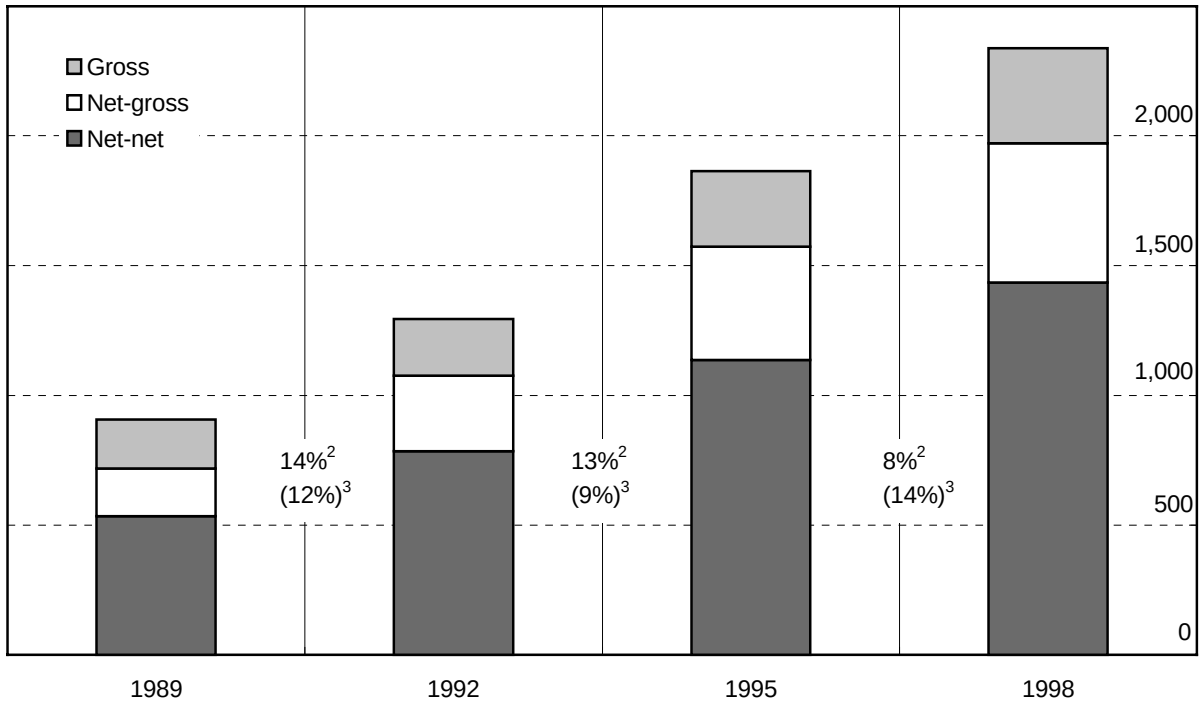
After adjustments for local and cross-border double-counting[2] and after taking into account estimated gaps in reporting,[3] the average daily turnover in global exchange markets in spot, outright forward and foreign exchange swap contracts was estimated at $1,500 billion in April 1998, compared with $1,190 billion in April 1995.

Once exchange rate movements are accounted for, the current survey provides evidence of strong growth in global foreign exchange market turnover in the most recent period. In current US dollar terms, the annual rate of growth of "net-net" turnover slowed to 8% in the 1995 - 1998 period, following growth of 13% in the previous survey period. However, the initial fall and subsequent advance of the dollar against all major currencies except the pound sterling (Graph B-1) implies first artificially high and then low rates of growth in these other currencies. Thus, using April 1998 exchange rates, the 1992 to 1995 period shows a 9% annualized increase, compared with 14% in 1995 to 1998. This rapid pace of expansion occurred despite the forthcoming introduction of the European single currency, the consolidation taking place in the financial industry and the drying up of business in the emerging market countries of Asia. While the globalisation of investment was an underlying source of activity, the rapid build up of leveraged positions until mid - 1998 has undoubtedly been an important supportive factor.

Graph B-2

Measures of global foreign exchange market activity[1]

Average daily turnover in billions of US dollars



[1] "Gross", i.e. as reported; "net-gross", i.e. adjusted for local inter-dealer double counting; "net-net", i.e. adjusted for both local and cross-border inter-dealer double counting. [2] Annualised growth rate of "net-net" data at current exchange rates. [3] Annualized growth rate at constant April 1998 exchange rates.

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[2] Data adjusted for local double-counting are referred to as "net-gross", while those adjusted for both local and cross-border double-counting are referred to as "net-net".

[3] See footnote 3 to Table B-2.

Table B-2

Measures of global foreign exchange market activity[1]

Average daily turnover in billions of US dollars

	April 1989	April 1992	April 1995	April 1998
Total reported gross turnover	**907**	**1,293**	**1,864**	**2,350**
Adjustment for local double-counting[2]	–189	–217	–293	–368
Total reported turnover net of local double-counting ("net-gross")	**718**	**1,076**	**1,572**	**1,982**
Adjustment for cross-border double-counting[2]	–184	–291	–435	–540
Total reported "net-net" turnover	**534**	**785**	**1,137**	**1,442**
of which: cross-border transactions	..	392	611	772
Estimated gaps in reporting[3]	56	35	53	58
Estimated global turnover	**590**	**820**	**1,190**	**1,500**

[1] Data include spot transactions, outright forwards and foreign exchange swaps. Number of reporting countries in 1989: 21; 1992 and 1995: 26; and 1998: 43. [2] In principle made by halving positions vis-à-vis other local reporting dealers and other reporting dealers abroad respectively. [3] Includes estimates for less than full coverage within individual reporting countries and for under-reporting of activity between non-reporting countries.

3. Currency composition

The US dollar was once again by far the most actively traded currency, being involved in 87% of all transactions worldwide,[4] compared with 83% in 1995 (Table B-3). The US currency continued to benefit from its predominance in commercial relations and its market liquidity. While the weakness of the dollar in 1995 had depressed its share at that time, it returned in 1998 to approximately the position it occupied in 1989. The US dollar was used in seven of the ten most heavily traded currency pairs (Table B-4), partly due to its use as a vehicle currency for cross-trading between other currencies. In many currency pairs involving the US dollar, foreign exchange swaps account for two-thirds or more of turnover, reflecting the standard practice of using the US dollar as a conduit when swapping into or out of third currencies.[5]

The Deutsche mark remained the second most used international currency, with almost a third of all currency trades. Although the currency was increasingly used as a proxy for the euro, its share continued to decline since the peak reached in 1992 as a result of the lower volatility of European cross-rates. The recent fall can largely be attributed to Deutsche mark/French franc business, which declined from 3% of total turnover in 1995 to 0.7% in 1998. Direct trades of domestic currency with the Deutsche mark made a modest contribution (less than 10%) to total turnover, with the exception of Greece, Italy, the Netherlands and Portugal in the European Union (EU); and the Czech Republic, Hungary and Poland outside the EU (see Annex Table E-7).

The proportion of turnover involving the pound sterling increased slightly (to 11%), bringing to an end the relative decline observed since 1989. There was a particularly strong revival of sterling/Deutsche mark business, which rose by 46% to $31 billion, as investment strategies tended to diversify away from the euro area.

4 Since every foreign exchange transaction involves two currencies, the proportional contributions of all currencies to total turnover sum to 200% (See also Annex Tables E-1 and E-4). Currency pairs, on the other hand, sum to 100%.

5 The foreign exchange swaps market plays a much reduced role for other major currencies such as the Deutsche mark and the Japanese yen, with 75% to 80% of trades against non-dollar currencies being conducted spot and only 8% to 10% being accounted for by foreign exchange swaps. Trades of these currencies with the US dollar are more balanced, with both spot and swaps business accounting for roughly 45% of turnover.

Table B-3

Currency distribution of global foreign exchange market activity[1]

Percentage shares of daily turnover

	April 1989	April 1992	April 1995	April 1998
US dollar	90	82	83	87
Deutsche mark[2]	27	40	37	30
Japanese yen	27	23	24	21
Pound sterling	15	14	10	11
French franc	2	4	8	5
Swiss franc	10	9	7	7
Canadian dollar	1	3	3	4
Australian dollar	2	2	3	3
ECU and other EMS currencies	4	12	15	17
Other currencies	22	11	10	15
All currencies	**200**	**200**	**200**	**200**

[1] Whenever reported on one side of transactions. The figures relate to reported "net-net" turnover, i.e. they are adjusted for both local and cross-border double-counting, except in 1989, for which data are only available on a "gross-gross" basis. [2] Data for April 1989 exclude domestic trading involving the Deutsche mark in Germany.

While turnover in other EMS currencies grew by 49%, this was more than accounted for by trades with the US dollar and cross-trading, as turnover with the Deutsche mark declined by 8%. Apart from exchange rate effects, this pattern of activity was possibly linked to increased stability in the ERM, similar to that seen following the departure of the pound sterling and the Italian lira from the ERM in September 1992. Turnover in the ECU declined from $26 billion to $21 billion (see also Annex Table E-1). This may have been due to lower market liquidity, as well as the narrowing of spreads between the actual and theoretical ECU yields which reduced the possibilities for arbitrage.

The Japanese yen retained its position as the third most actively traded currency, mainly against the US dollar (89%) and the Deutsche mark (8%). However, on the basis of constant April 1998 exchange rates, the share of the Japanese yen has increased from 18% to 21%. This interpretation would be more consistent with factors which might have been expected to increase turnover, such as the initiatives taken during the preceding three years to liberalise Japanese financial markets, on the one hand, and reports of significant yen carry trades[6] on the other. The geographical breakdown indicates that US dollar/yen trading continues to be concentrated in Asian/Pacific centres and the US. There is little direct trade of domestic currency against the yen, with the exception of Greece (18%) - where mutual funds invested in low yielding yen deposits to reduce tax liabilities - and Portugal (6%).

Although data on emerging market currencies were not collected explicitly, turnover in local currency (Annex Table E-7) provides a fairly good estimate of market size, at least to the extent that offshore trading is limited. Since most of these countries participated for the first time, no comparative survey data are available for 1995. However, the crisis which developed in the wake of the devaluation of the Thai baht on 1 July 1997 has probably hampered turnover in Asian emerging market currencies (Table B-1). Overall, the US dollar occupies a very strong position in the trading of emerging markets' currencies, accounting for more than 90% of turnover in most countries. The exceptions are markets in eastern Europe such as Poland, Hungary and the Czech Republic, where trades against the Deutsche mark accounted for 17% to 33% of turnover.

6 See Beranger, Galati, Tsatsaronis and von Kleist, "The yen carry trade and recent foreign exchange market volatility" in *International Banking and Financial Market Developments*, BIS, March 1999, p.33.

Table B-4

Reported foreign exchange market turnover by currency pair

Daily averages in billions of US dollars and percentage shares

April 1995					April 1998				
	Total	Spot	Outright forwards	Foreign exchange swaps		Total	Spot	Outright forwards	Foreign exchange swaps
	Amount	Percentage share				Amount	Percentage share		
USD/DEM	253.9	56	7	37	USD/DEM	290.5	49	8	43
USD/JPY	242.0	36	9	55	USD/JPY	266.6	45	10	44
USD/othEMS	104.3	19	8	73	USD/othEMS	175.8	14	7	79
USD/GBP	77.6	33	7	60	USD/GBP	117.7	33	9	59
USD/CHF	60.5	37	9	55	USD/CHF	78.6	30	7	62
USD/FRF	60.0	17	9	74	USD/FRF	57.9	16	8	76
DEM/othEMS	38.2	74	9	17	USD/CAD	50.0	25	6	68
USD/CAD	38.2	32	11	57	USD/AUD	42.2	33	8	59
DEM/FRF	34.4	86	4	9	DEM/othEMS	35.1	75	12	13
USD/AUD	28.7	31	7	63	DEM/GBP	30.7	79	10	11
DEM/JPY	24.0	79	12	9	DEM/JPY	24.2	77	14	9
DEM/GBP	21.3	84	6	10	DEM/CHF	18.4	85	7	8
DEM/CHF	18.4	86	6	7	USD/XEU	16.6	7	4	89
USD/XEU	17.9	11	7	82	SGD/USD*	17.2	71	2	27
All currency pairs	**1,136.9**	43	9	48	**All currency pairs**	**1,441.5**	40	9	51

* Data cover only transactions where at least one counterparty is located in Singapore.

4. Types of counterparty

Compared with 1995, the distribution of counterparties remained largely stable, with a large share accounted for by trade among reporting dealers (63%). Since the category "Other financial institutions" covers any financial institution not participating in the survey, a slight decline in this category can partly be ascribed to more comprehensive coverage. As in 1995, more than half (59%) of business between reporting dealers is transacted across borders, while business with non-financial customers is more locally oriented, with about two-thirds (68%) of deals being struck in the domestic market.

As can be seen in Graph B-3 (left panel), in medium-sized markets there is a tendency for the share of turnover accounted for by local dealers to be comparatively low. In these markets, greater reliance on major financial centres to intermediate business tends to dampen the share of local transactions. In contrast, in the very large markets (the United Kingdom, the United States and Japan) the local market is so large and liquid that many deals are done with local counterparties. In the smallest markets, marked differences in financial regulations, costs and structures imply a wide dispersion in the respective weights of cross-border and local business.

There are also disparities between centres with respect to the share of business conducted with non-financial customers (Graph B-3, right panel). Non-financial customers account for 20% to 30% of turnover in the smaller markets, but their share tends to fall rapidly as markets increase in size. The relatively high share of non-financial customers in the United States and Japan is consistent with the comparatively high ratio of foreign trade to foreign exchange turnover in these two countries.

Table B-5

Geographical distribution of global foreign exchange market activity[1]

Average daily turnover in billions of US dollars

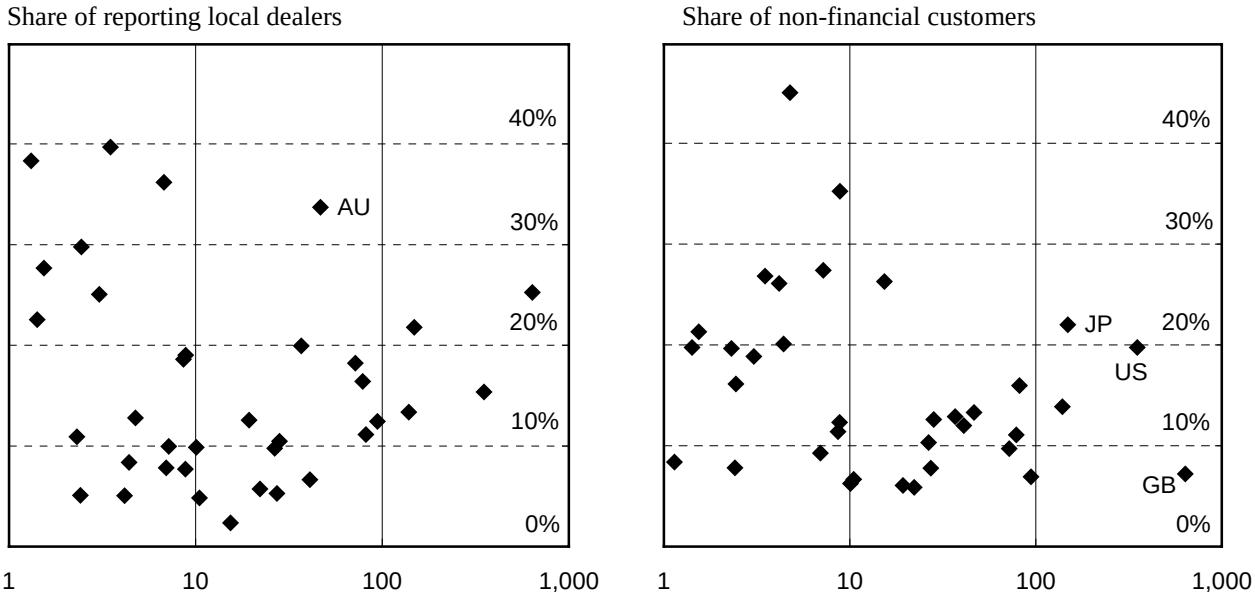
	April 1989		April 1992		April 1995		April 1998	
	Amount	**Percentage share**	**Amount**	**Percentage share**	**Amount**	**Percentage share**	**Amount**	**Percentage share**
Argentina	..	..	..	..	..	..	2.2	0
Australia	28.9	4	29.0	3	39.5	3	46.6	2
Austria	..	..	4.4	0	13.3	1	10.5	1
Bahrain	3.0	0	3.5	0	3.1	0	2.4	0
Belgium	10.4	1	15.7	1	28.1	2	26.5	1
Brazil[2]	..	..	..	..	..	..	5.1	0
Canada	15.0	2	21.9	2	29.8	2	36.8	2
Chile	..	..	..	..	..	..	1.3	0
China[2]	..	..	..	..	..	..	0.2	0
Czech Republic	..	..	..	..	..	..	5.0	0
Denmark	12.8	2	26.6	2	30.5	2	27.3	1
Finland[3]	3.4	0	6.8	1	5.3	0	4.2	0
France	23.2	3	33.3	3	58.0	4	71.9	4
Germany	..	..	55.0	5	76.2	5	94.3	5
Greece	0.4	0	1.1	0	3.3	0	7.2	0
Hong Kong	48.8	7	60.3	6	90.2	6	78.6	4
Hungary	..	..	..	..	..	..	1.4	0
India	..	..	..	..	..	..	2.4	0
Indonesia	..	..	..	..	..	..	1.5	0
Ireland	5.2	1	5.9	1	4.9	0	10.1	1
Italy	10.3	1	15.5	1	23.2	1	28.2	1
Japan	110.8	15	120.2	11	161.3	10	148.6	8
Luxembourg	..	..	13.2	1	19.1	1	22.2	1
Malaysia	..	..	..	..	..	..	1.1	0
Mexico	..	..	..	..	..	..	8.6	0
Netherlands	12.9	2	19.6	2	25.5	2	41.0	2
New Zealand	..	..	4.2	0	7.1	0	6.9	0
Norway	4.3	1	5.2	0	7.6	0	8.8	0
Philippines	..	..	..	..	..	..	0.8	0
Poland[4]	..	..	..	..	..	..	2.7	0
Portugal	0.9	0	1.3	0	2.4	0	4.4	0
Russia	..	..	..	..	..	..	6.8	0
Saudi Arabia	..	..	..	..	..	..	2.3	0
Singapore	55.0	8	73.6	7	105.4	7	139.0	7
South Africa	..	..	3.4	0	5.0	0	8.8	0
South Korea	..	..	..	..	..	..	3.5	0
Spain	4.4	1	12.3	1	18.3	1	19.3	1
Sweden	13.0	2	21.3	2	19.9	1	15.4	1
Switzerland	56.0	8	65.5	6	86.5	6	81.7	4
Taiwan	..	..	..	..	..	..	4.8	0
Thailand	..	..	..	..	..	..	3.0	0
United Kingdom	184.0	26	290.5	27	463.8	30	637.3	32
United States	115.2	16	166.9	16	244.4	16	350.9	18
Total "net-gross" turnover	**717.9**	**100**	**1,076.2**	**100**	**1,571.8**	**100**	**1,981.6**	**100**

[1] Data are adjusted for local double-counting ("net-gross"). Estimated coverage of the foreign exchange market ranged between 90 and 100 in most countries, and between 66 and 80 in a few countries. [2] Data only cover spot transactions. [3] Data for 1992 not adjusted for local double-counting. [4] Data only cover interbank transactions.

Graph B-3

Global foreign exchange market turnover by country and counterparty*

In percentages and billions of US dollars



* On a "net-gross" basis, i.e. adjusted for local inter-dealer double-counting.

5. Geographical patterns

The trend towards the concentration of foreign exchange market turnover in a few centres continued. The four largest centres - the United Kingdom (32%), the United States (18%) Japan (8%) and Singapore (7%) - accounted for 64% of total reported turnover net of local dealer double-counting (62% in 1995). In current dollar terms, the solid gains in London and New York were to some extent counter-balanced by a decline in the Tokyo market. Once again, London strengthened its position as the foremost global centre. UK foreign exchange trading is so substantial that a larger share of turnover in both the US dollar (32%) and the Deutsche mark (34%) takes place in the United Kingdom than in either the US (18%) or Germany (10%) (Annex Table E-4).

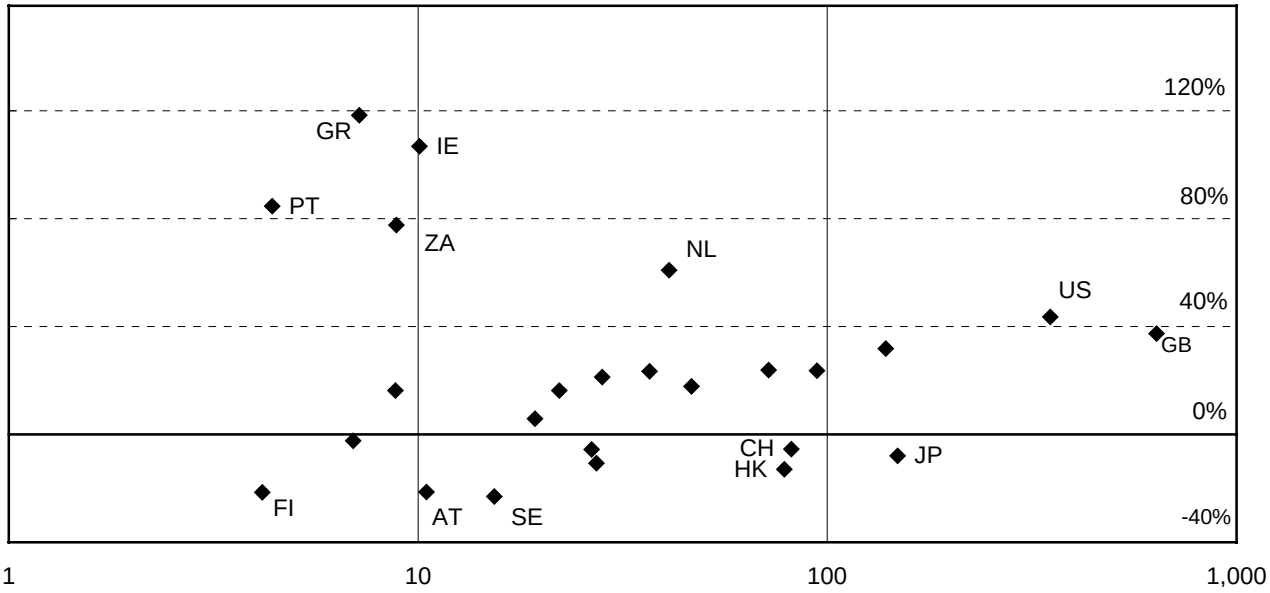
Overall, among the major markets, only Singapore (87%) has a higher proportion of turnover accounted for by fully non-domestic currency transactions than London (82%). Due to strong growth since 1995, Singapore has maintained its 7% share of the market and has almost closed the gap with Tokyo. Partly owing to its lower degree of dependence on yen business, Singapore managed to avoid the decline in turnover associated with the Asian crisis that was evident in some of the other centres, such as Hong Kong (-13%). Germany replaced Hong Kong as the fifth largest foreign exchange market worldwide. Germany also overtook Switzerland, where turnover declined 6% compared to 1995. Switzerland now ranks sixth ahead of Hong Kong. Paris maintained its rank as the eighth most active centre.

While there has been low or even negative growth in some smaller markets (see Graph B-4, in particular Finland, Austria and Sweden), a number of others showed quite spectacular advances (Greece, Ireland, Portugal, South Africa and the Netherlands). Although one might attribute the decline in some European reporting centres to the advent of the euro, the very strong growth rates seen in Ireland, Portugal and the Netherlands suggest that other factors may also have played a role. In Portugal, growth was driven mainly by the continuing positive effects of the liberalisation of the foreign exchange market which was completed by the end of 1992 and convergence trades in the run-up to EMU. Similar considerations apply in the case of Greece, with large capital inflows following the March 1998 devaluation and the entry of the drachma into the Exchange Rate Mechanism (ERM) of the EMS. In the Netherlands, there was strong growth in the local market, with institutional investors, in particular, expanding their international portfolios and one major bank moving its dealing rooms from London to Amsterdam.

Graph B-4

Foreign exchange turnover growth 1995/1998 and market size*

In percentages and billions of US dollars



* On a "net-gross" basis, i.e. adjusted for local inter-dealer double-counting.

6. Types of transaction

Spot transactions are exchanges of two currencies for settlement in two business days.[7] Ten years ago, the spot market accounted for 59% of foreign exchange turnover. This proportion has now declined to only 40% (Table A-1). As noted above, the spot market still accounts for 70% or more of total turnover for most non-US dollar currency pairs, including in particular most transactions involving the Deutsche mark. This may have been due partly to the vehicle currency role of the Deutsche mark within Europe.

Outright forward transactions form the smallest segment of the market.[8] A relatively large share of outright forward deals are concluded with non-financial customers (36%) and local business accounts for more than half (62%) of total turnover (Annex Table E-1). These characteristics indicate that the outright forward market is oriented towards the retail trading and hedging needs of commercial customers. Given the less standardised nature of maturities and amounts, there are fewer participants and lower volumes in this sector.

Graph B-5 plots spot business as a percentage share of total foreign exchange turnover, most of the remainder being accounted for by foreign exchange swaps. While there is a wide dispersion in the relative importance of the spot market in the smaller centres (ranging from 25% to 100% of total turnover), larger centres have a share of between 35% and 45%.

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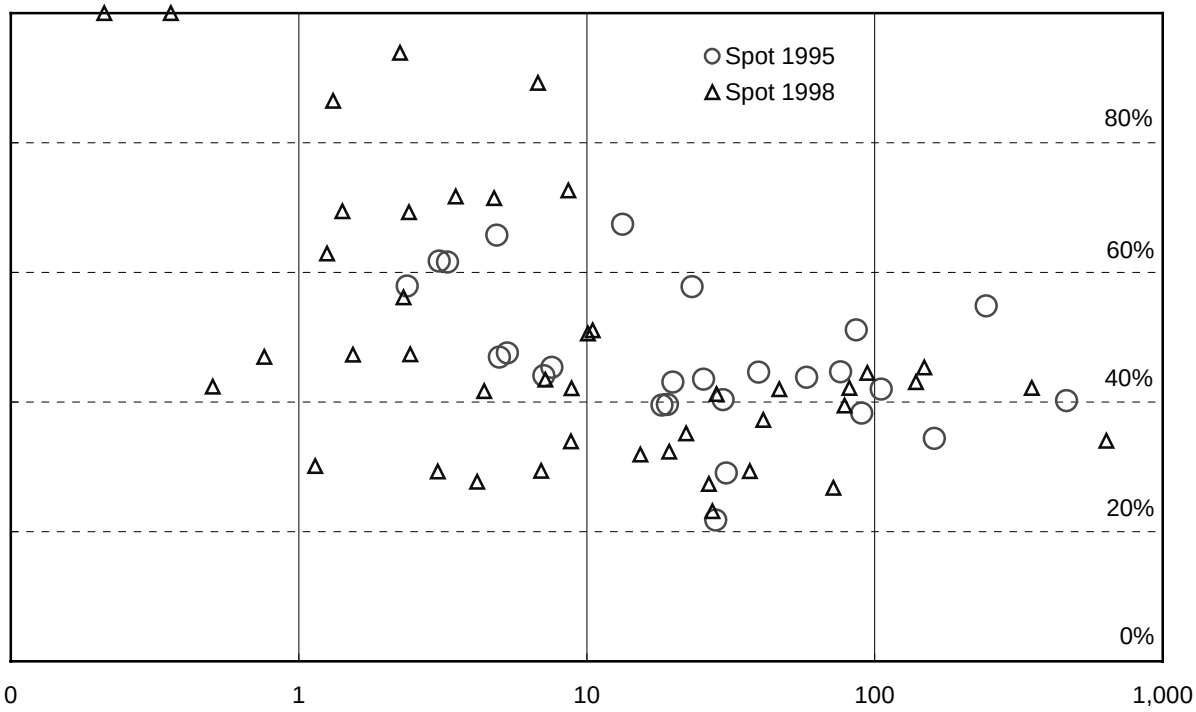
7 However, exposures can often be for longer periods. See "*Settlement Risk in Foreign Exchange Transactions*", BIS, March 1996.

8 In an outright forward transaction, two currencies are exchanged at an agreed forward rate for settlement more than two business days after the conclusion of the deal, locking in current exchange rates and thus eliminating the risk that exchange rates may move in the interim period.

Graph B-5

Share of spot market transactions in total foreign exchange market turnover by reporting country in April 1995 and April 1998*

In percentages and billions of US dollars



* On a "net-gross" basis, i.e. adjusted for local inter-dealer double-counting.

As in 1995, 85% of all forward transactions were made up of foreign exchange swaps (Annex Table E-1).[9] The foreign exchange swaps market is largely a US dollar market. Indeed, 95% of all swaps involve the US dollar. Liquidity considerations, i.e. the ability to undertake large deals without moving prices significantly, might explain the migration of activity to the largest centres.

Long-term transactions (beyond one year) are comparatively rare in both sectors of the forward market, accounting for roughly 4% and 1% respectively of forward and swap turnover. Major exceptions are seen in the outright forward market in Finland (57%) and Germany (34%) (Annex Table E-12).

The average deal size for spot and forward transactions in the US market hardly changed between 1992 and 1998, remaining at approximately $4 million. By contrast, the average size of foreign exchange swaps, which had previously amounted to about $15 million, jumped to $31 million.[10]

[9] Foreign exchange swaps are agreements to exchange two currency amounts on a given date and to reverse this exchange at a later date. Since the exchange is later reversed, currency risk is eliminated, but replaced by some credit risk, i.e. the risk that the swap partner may not be able to return the swapped amount. They are closely linked to money market transactions and are used to hedge currency risk and manage liquidity.

[10] *Foreign Exchange and Interest Rate Derivatives Markets Survey Turnover in the United States*, Federal Reserve Bank of New York, September 1998, p. 9.

7. Other features of the foreign exchange market

7.1 Foreign exchange brokers

In the UK market, the proportion of total foreign exchange business transacted by brokers fell from 35% in 1995 to 27% in 1998, the remainder being conducted bilaterally between counterparties. Electronic brokers increased their share of total foreign exchange turnover from 5% in 1995 to 11% in 1998. In consequence, the proportion of business conducted by traditional voice brokers, who quote prices over telephone lines to dealing rooms, declined from 30% to 16%. Electronic brokers now handle almost one quarter of total spot transactions in the UK market. While a wider range of currency pairs and products is available, spot trading of the US dollar/Deutsche mark and US dollar/Japanese yen still accounts for most of electronic brokers' volumes. More than 95% of other currency pairs such as the pound sterling/US dollar and the US dollar/Swiss franc are handled by a single electronic broking system.[11]

In the US, almost one-third of all transactions in the spot market were conducted through an automated order-matching system, compared to 10% in 1995. Spot trading still accounted for 98% of all automated transactions. In Tokyo, brokers increased their share of trading from 28% to 36%. Electronic brokers accounted for 36% of spot trades compared with 12% in 1995.

7.2 Market concentration and market share of foreign banks

The trend towards growing market concentration in major individual market centres continued.[12] In London, the combined share of the top 10 dealers, rose from 44% to 50%. In the US, the top 10 dealers' market share rose from 48% to 51%. However, only six out of the top 10 firms in 1995 remained in the top 10 in 1998. Among the six that remained in the top 10, only one saw its rank rise, while the other five saw their rank drop. The higher degree of concentration may have been partly related to the consolidation taking place in the financial industry.

In medium-sized markets, concentration tends to be higher. In France, for example, the top 10 institutions alone accounted for 80% of turnover. Moreover, while previous surveys in the UK found that business in the most actively traded currencies was more widely dispersed than in others, in 1998 the share of the top ten dealers was in a range of 52% to 57% for most currency pairs. In smaller markets, countries reporting a decline in the number of banks covering 75% of turnover (see Table B-1) outweighed those reporting an increase (13 versus 4 respectively).

The international nature of the foreign exchange market is underscored by the major role played by foreign-owned institutions, with for example those operating in the UK accounting for 85% of aggregate turnover in 1998, up from 79% in 1995. North American entities located in this country remain the most active, with a 49% market share, up from 42% in 1995. In contrast, UK principals' share of sterling trading declined, partly reflecting mergers with institutions in the EU. The proportion transacted by Japanese dealers also declined, from 10% to 7%. In Tokyo itself, foreign banks increased their share of total turnover from 49% in 1995 to 57% in 1998. Their share in customer transactions rose from 31% to 65%.[13]

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[11] *The Foreign Exchange and Over-The-Counter Derivatives Markets in the United Kingdom*, Bank of England Quarterly Bulletin, November 1998, p. 352.

[12] Such information is not available on a global basis.

[13] *Foreign Exchange and Derivatives Markets Turnover Survey (April 1998)*, Bank of Japan Quarterly Bulletin, November 1998, p. 220.

C. Derivatives market activity

It should be noted at the outset that the coverage of derivatives activity in this survey differs from that in the 1995 survey in ways that prevent full comparability of the data. First, in order to limit the burden on reporting participants, turnover data in the 1998 survey covered only over-the-counter (OTC) instruments. The BIS already regularly collects turnover data on exchange-traded instruments from the exchanges themselves. Among the OTC instruments, the turnover data also excluded the smaller market segments, such as those comprised by equity, commodity, and credit-related contracts. Second, the derivatives data on amounts outstanding (notional amounts and gross market values) were reported for end-June rather than end-March and thus differ in the reporting time of the year from that of the previous survey. The change in reporting date was made to ensure consistency with the newly introduced semi-annual statistics on global positions in OTC derivatives markets. Third, whereas *turnover* activity was recorded on a locational basis, worldwide consolidated derivatives *positions* were considered to be more meaningful and were thus gathered on that basis. This worldwide consolidation also meant that any reporting gaps would be negligible. Hence, because of differences in market coverage, reporting date, and reporting principle, comparing the results of the current derivatives survey to those in the 1995 survey requires a degree of care.

Table C-1

Global turnover in OTC derivatives markets

Daily averages in billions of US dollars

	Total		**Foreign exchange[1]**		**Interest rates[2]**	
	April 1995	**April 1998**	**April 1995**	**April 1998**	**April 1995**	**April 1998**
Total reported gross turnover	**1,368**	**1,990**	**1,114**	**1,576**	**254**	**415**
Adjustment for local double-counting[3]	–206	–306	–161	–235	–45	–71
Total reported turnover net of local double-counting ("net-gross")	1,162	1,684	953	1,341	209	344
Adjustment for cross-border double-counting[3]	–323	–457	–265	–380	–58	–78
Total reported "net-net" turnover	**839**	**1,226**	**688**	**961**	**151**	**265**
with reporting dealers	529	764	427	615	102	150
local	207	306	162	235	45	71
cross-border	322	457	265	380	57	78
with other financial institutions	181	267	149	178	32	89
local	90	125	74	80	16	46
cross-border	91	142	75	99	16	44
with non-financial customers	129	195	111	168	17	27
local	88	127	76	110	12	16
cross-border	41	68	35	58	5	10
Estimated gaps in reporting [4]	41	39	32	29	9	10
Estimated global turnover	**880**	**1,265**	**720**	**990**	**160**	**275**
Memorandum item:						
Exchange-traded products[5]	*1,222*	*1,373*	*17*	*12*	*1,205*	*1,361*

[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: Futures Industry Association; various futures and options exchanges.

Table C-2

Reported turnover in OTC derivatives markets by currency pair[1]

Daily averages in billions of US dollars

Foreign exchange contracts

	Total		of which			
			Outright forwards		Forex swaps	
	April 1995	April 1998	April 1995	April 1998	April 1995	April 1998
US dollar with other currencies	630	882	77	106	518	699
Deutsche mark	122	165	18	22	93	124
Japanese yen	169	182	22	28	133	118
Pound sterling	53	84	5	10	46	69
Other EMS currencies	147	224	15	18	129	197
Other	139	227	17	27	117	190
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	17	3	3	5	10
Japanese yen with other currencies[3]	2	6	1	3	1	2
Other currency pairs	17	20	4	6	7	11
All currency pairs	**688**	**961**	**97**	**130**	**546**	**734**

Interest rate contracts[4]

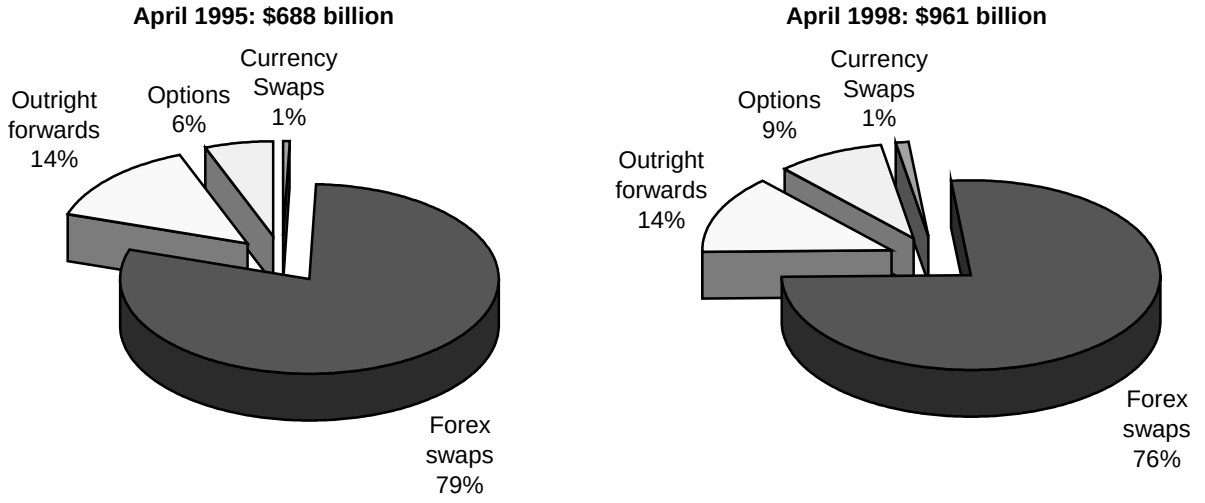
	Total		of which			
			FRAs		Swaps	
	April 1995	April 1998	April 1995	April 1998	April 1995	April 1998
US dollar	41	71	18	23	17	36
Deutsche Mark	18	63	9	9	7	47
Japanese yen	35	27	10	3	17	14
Other	58	104	30	39	22	58
Total turnover	**151**	**265**	**66**	**74**	**63**	**155**

[1] Adjusted for local and cross-border double-counting. [2] Excluding the US dollar. [3] Excluding the US dollar and the Deutsche mark.[4] Single-currency contracts only.

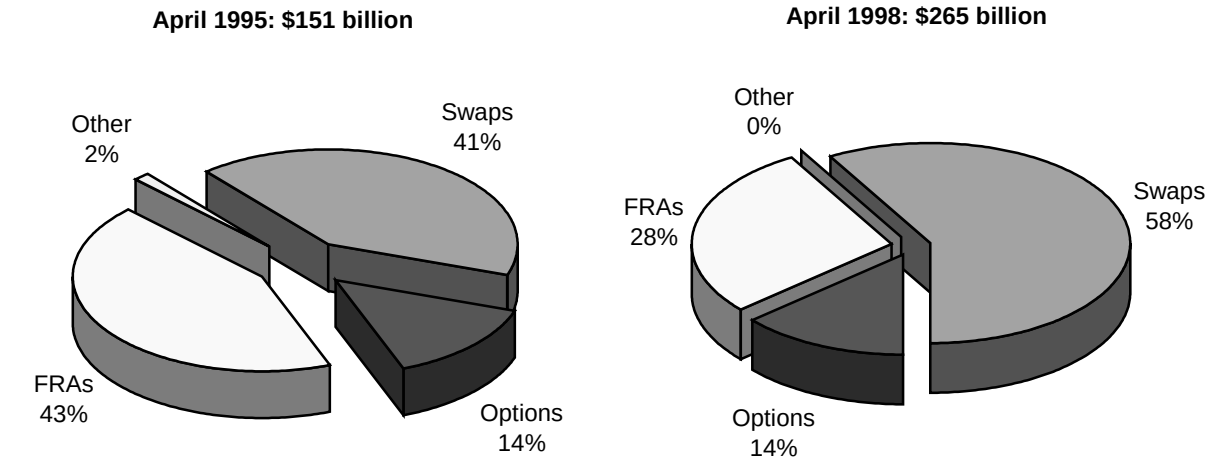
Graph C-1

Reported global average net daily turnover in OTC derivatives markets by instrument

Foreign exchange contracts



Interest rate contracts



1. Daily turnover in OTC derivatives markets

Activity in the OTC derivatives markets tends to involve the writing of new contracts and, unlike exchange-traded positions, OTC contracts are seldom closed out before their expiration dates. Global OTC turnover is reported in Table C-1, showing adjustments for double-counting in local and cross-border transactions. Turnover in foreign exchange contracts grew from $720 billion a day in April 1995 to $990 billion a day in April 1998, compared with an increase from $160 billion to $275 billion in interest rate contracts. Whereas notional amounts outstanding have been higher for interest rate contracts than for foreign exchange contracts, turnover has been greater for the latter. One reason for this is that foreign exchange contracts have tended to have considerably shorter terms than interest rate contracts.[14]

[14] The very short-term nature of most foreign exchange contracts also favour OTC over exchange-traded transactions.

Table C-3

Geographical distribution of reported OTC derivatives market activity[1]

Average daily turnover in billions of US dollars

	Total		Foreign exchange[2]		Interest rates[3]	
	April 1995	**April 1998**	**April 1995**	**April 1998**	**April 1995**	**April 1998**
Argentina	..	0.1	..	0.1	..	..
Australia	25.7	31.6	22.9	28.8	2.8	2.8
Austria	6.6	9.7	4.5	6.4	2.2	3.3
Bahrain	5.3	1.1	1.3	0.9	4.0	0.2
Belgium	28.2	24.9	22.4	20.1	5.8	4.9
Brazil	..	..	..	..	..	..
Canada	23.1	33.6	18.7	27.2	4.4	6.4
Chile	..	0.5	..	0.5	..	..
China	..	..	..	..	..	..
Czech Republic	..	3.0	..	3.0	..	..
Denmark	25.6	25.9	22.9	21.7	2.7	4.2
Finland	4.5	5.4	2.9	3.3	1.6	2.1
France	54.9	98.5	36.1	57.9	18.8	40.6
Germany	56.0	86.7	45.1	57.6	10.9	29.1
Greece	1.4	4.1	1.3	4.1	0.1	0.0
Hong Kong	59.9	51.4	56.4	48.9	3.5	2.4
Hungary	..	0.5	..	0.5	..	0.0
India	..	1.3	..	1.3	..	..
Indonesia	..	1.0	..	1.0	..	..
Ireland	3.2	7.4	1.7	5.6	1.5	1.8
Italy	12.3	21.2	10.8	17.1	1.5	4.1
Japan	138.6	123.3	112.2	91.7	26.4	31.6
Luxembourg	13.7	16.9	11.7	14.9	2.0	2.0
Malaysia	..	0.8	..	0.8	..	0.0
Mexico	..	2.6	..	2.4	..	0.2
Netherlands	19.6	31.0	15.5	27.5	4.1	3.5
New Zealand	4.2	5.4	4.1	5.0	0.2	0.4
Norway	5.6	8.7	4.2	5.9	1.5	2.8
Philippines	..	0.4	..	0.4	..	..
Poland	..	0.5	..	0.5	..	..
Portugal	1.1	3.6	1.0	2.6	0.1	1.0
Russia	..	0.9	..	0.9	..	..
Saudi Arabia	..	1.4	..	1.1	..	0.2
Singapore	79.2	90.7	63.0	85.4	16.3	5.3
South Africa	3.0	6.0	2.8	5.2	0.2	0.8
South Korea	..	1.1	..	1.0	..	0.0
Spain	14.6	16.6	11.2	13.7	3.4	2.9
Sweden	13.7	14.8	11.8	11.2	1.9	3.6
Switzerland	46.7	63.0	44.2	57.2	2.4	5.9
Taiwan	..	1.6	..	1.5	..	0.1
Thailand	..	2.2	..	2.2	..	..
United Kingdom	351.2	591.2	292.4	468.3	58.8	122.9
United States	163.6	293.8	131.8	235.4	31.7	58.4
Total "net-gross" turnover	**1,161.5**	**1,684.4**	**953.0**	**1,340.7**	**208.6**	**343.6**

[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.

Swaps have come to dominate turnover in both the foreign exchange and interest rate segments of the OTC market. As shown in Graph C-1, the mix of instruments has remained largely unchanged in the foreign exchange segment, where foreign exchange swaps accounted for 76% of turnover in April 1998, only a slight decline from April 1995. Among interest rate contracts, the share of swaps in market turnover rose from 41% to 58%. The rise in interest rate swaps came at the expense of FRAs, for which turnover declined from 43% to 28%.

Contracts involving the US dollar continued to dominate turnover in the OTC market (92%). As shown in Table C-2, the dollar segment of turnover in foreign exchange contracts rose from $630 billion a day in April 1995 to $882 billion a day in April 1998. In OTC interest rate contracts, the use of the Deutsche mark began to rival that of the dollar. The mark's role as a proxy for the euro together with the proliferation of convergence strategies among European currencies seem to have led to a surge of activity in DM swaps until the middle of 1998. The mark's share of turnover in interest rate contracts rose from 12% of market turnover in April 1995 to 24% in April 1998. The dollar held on to 27% of market turnover in April 1998.

The most important centres for OTC derivatives remained London and New York, which consolidated their positions as number one and number two in trading activity. As reported in Table C-3, the amount of OTC foreign exchange derivatives traded in London during April 1998 amounted to $468 billion a day, while such trading in New York amounted to $235 billion a day. The other major trading centres were Tokyo, Singapore, Paris, Frankfurt, and Zurich, but among these centres only Paris kept pace with the growth of turnover in London and New York. Such increased geographical concentration tended to follow that of spot transactions. Derivatives turnover in some of the smaller European centres did grow spectacularly, particularly in Athens, Dublin and Lisbon.

In OTC interest rate derivatives, again London and New York both held increased sway, with London trading $123 billion a day during April 1998 and New York trading $58 billion a day. Paris and Frankfurt joined Tokyo as the next most important major trading centres for these derivatives. As shown in Table C-3, the increase in concentration of trading in the top five countries was more pronounced for interest rate contracts than for foreign exchange ones. The OTC interest rate market appears to be slightly less concentrated than the currency market. In the UK, for example, the top 20 companies held 82% of interest rate contracts compared with 91% for the currency market. Although market makers across G10 countries are generally highly-rated, too high a concentration of exposures would raise questions concerning systemic stability.[15]

2. Notional amounts and gross market values

Notional amounts outstanding provide a measure of the market risk exposures that participants choose to face at the time they engage in derivatives transactions. Since there is no payment of principal for many of the contracts, notional amounts in these cases are poor indicators of exposures to counterparty credit risk. As shown in Table C-4, after adjusting for double counting in local and cross-border transactions among reporting institutions, the notional amount of outstanding OTC contracts reached $72 trillion at the end of June 1998. This amount represented an average yearly rise of 15% since March 1995. Foreign exchange contracts expanded by 8% a year in notional terms to reach $22 trillion by end-June 1998. Interest rate contracts grew at a much faster pace of 19% a year to reach $48 trillion at period's end. As shown in Table C-5, the volume of equity-linked contracts remained much smaller ($1 trillion) but expanded at an average rate of 32% a year in notional terms. Commodity contracts remained a small part of the OTC market, while credit-linked contracts began to register significant notional amounts.

[15] See: *Issues of Measurement Related to Market Size and Macroprudential Risks in Derivatives Markets*, ECSC/BIS, February 1995, and *Proposals for Improving Global Derivatives Market Statistics*, ECSC/BIS, July 1996.

Table C-4

Global positions in OTC derivatives markets and estimated gaps in reporting

Amounts outstanding in billions of US dollars

	Positions at end-March 1995[1]			Positions at end-June 1998		
	Total	**Foreign exchange**	**Interest rates[2]**	**Total**	**Foreign exchange**	**Interest rates[2]**
Notional amounts						
Reported global positions	63,763	20,217	42,377	102,898	30,894	69,578
Adjustment for double-counting[3]	–23,125	–7,121	–15,732	–30,755	–8,839	–21,454
Adjusted global positions	40,637	13,095	26,645	72,143	22,055	48,124
Estimated gaps in reporting	6,893	4,605	2,205	..	..	..
Estimated global positions	47,530	17,700	28,850	72,143	22,055	48,124
Memorandum items:						
Positions vis-à-vis own affiliates	..	..	..	25,754	8,654	17,100
Exchange-traded positions[4]	10,310	119	9,722	14,256	103	13,107
Gross market values						
Reported global positions	2,713	1,624	982	3,568	1,359	1,903
Adjustment for double-counting[3,5]	– 940	– 576	– 334	– 988	– 377	– 550
Adjusted global positions	1,773	1,048	647	2,580	982	1,354
Estimated gaps in reporting	432	372	53	..	..	..
Estimated global positions	2,205	1,420	700	2,580	982	1,354
Memorandum item:						
Gross credit exposure[6]	..	..	..	*1,203*	..	..

[1] In addition to changes in reporting months, differences in the reporting basis (locational reporting in 1995; worldwide consolidated reporting in 1998) and in the number of participating countries (26 in 1995; 43 in 1998) mean that the surveys of March 1995 and June 1998 are not really comparable. [2] Single-currency contracts only. [3] Made by halving positions vis-à-vis other reporting dealers. [4] Sources: Futures Industry Association; various futures and options exchanges. [5] Partly estimated for 1998. [6] Gross market values after taking into account legally enforceable bilateral netting agreements.

As prices for the underlying assets move, the accumulation of gains and losses on derivative contracts gives rise to gross market values. Hence, gross market values tend to reflect market volatility. These market values are also good indicators of current exposures to counterparty credit risk. As reported in Table C-4, gross market values on OTC derivative contracts at the end of June 1998 amounted to $2.6 trillion, or 3.6% of the notional amount. This is still considerably smaller than the total value of securities issues in major financial markets ($30.2 trillion) or international banking assets ($10.5 trillion). The ratio of gross market value to notional amount was lower than it was at the end of March 1995, when the ratio was 4.6%.

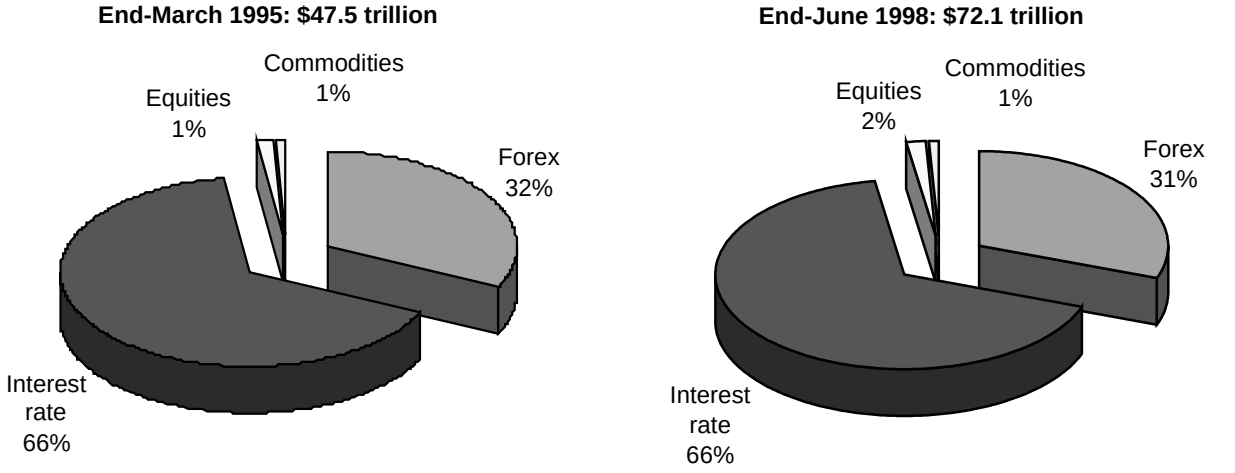
The decline in this ratio is partly a result of the fact that the underlying markets – specifically the major currency markets – were more volatile during the period leading up to March 1995 than during the period leading up to June 1998. At the same time, a shortening of maturities for foreign exchange contracts allowed less time for gross market values to build up.

Exposure to movements in interest rates remained the predominant source of market risk for OTC derivatives. As illustrated in Graph C-2, interest rate instruments accounted for 66% of the total notional amount of OTC derivative contracts at end-June 1998, while foreign exchange instruments accounted for 31% and equity instruments for 2%. Interest rate contracts maintained their share of the market, while equity contracts grew at the expense of foreign exchange ones.

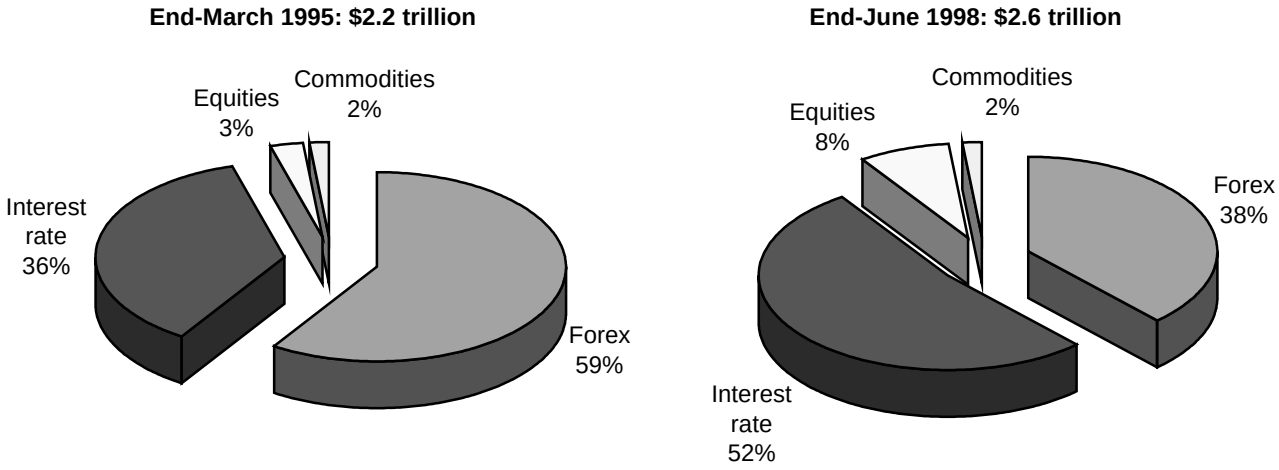
Graph C-2

Reported global net positions in OTC derivatives markets by market risk category

Notional amounts



Gross market values



Interest rate contracts accounted for the bulk of the gross market values of OTC derivatives at end-June 1998, but not to the degree that these contracts dominated in notional amounts. Outstanding interest rate contracts gave rise to 52% of gross market values, while foreign exchange contracts produced 38% and equity contracts 8%. These shares reflected significant differences in the ratios of gross market value to notional amount among the various contracts. For interest rate contracts, for example, the ratio was 2.8%, while it was 4.5% for foreign exchange contracts. In this particular case, one reason for the difference is that most foreign exchange contracts involve an exchange of principal, while interest rate contracts ordinarily involve no such exchange.[16] Foreign exchange contracts also represent exposure to both currency and interest rate risks. Hence, contractual structure as well as market volatility explain why interest rate instruments seem more dominant in notional terms than in terms of gross market values.

[16] 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.

Table C-5

Global positions in OTC derivatives markets by type of risk instrument[1]

In billions of US dollars

	Positions at end-March 1995[2]			Positions at end-June 1998		
	Notional Amounts	Gross market values	Percentages[3]	Notional Amounts	Gross market values	Percentages[3]
Foreign exchange contracts	**13,095**	**1,048**	**8.0**	**22,055**	**982**	**4.5**
Outright forward and forex	8,699	622	7.2	14,658	584	4.0
Currency swaps	1,957	346	17.7	2,324	255	11.0
Options	2,379	71	3.0	5,040	141	2.8
Other	61	10	16.4	33	2	3.8
Interest rate contracts[4]	**26,645**	**647**	**2.4**	**48,124**	**1,354**	**2.8**
FRAs	4,597	18	0.4	6,602	39	0.6
Swaps	18,283	562	3.1	32,942	1,186	3.6
Options	3,548	60	1.7	8,528	126	1.5
Other	216	7	3.2	52	2	2.7
Equity-linked contracts	**579**	**50**	**8.6**	**1,341**	**201**	**15.0**
Forwards and swaps	52	7	13.5	180	22	12.0
Options	527	43	8.2	1,161	180	15.5
Commodity contracts[5]	**318**	**28**	**8.8**	**506**	**39**	**8.0**
Gold	147	10	6.8	228	9	4.4
Other	171	18	10.5	278	30	10.9
Forwards and swaps	120	13	10.8	165	..	0.0
Options	51	5	9.8	113	..	0.0
Credit-linked and other contracts[6]	**..**	**..**	**..**	**118**	**4**	**3.1**
Estimated gaps in reporting	**6,893**	**432**	**6.3**	**..**	**..**	**..**
Total contracts	**47,530**	**2,205**	**4.6**	**72,143**	**2,580**	**3.6**

[1] Adjusted for inter-dealer double-counting. [2] In addition to changes in reporting months, differences in the reporting basis (locational reporting in 1995; worldwide consolidated reporting in 1998) and in the number of participating countries (26 in 1995; 43 in 1998) mean that the surveys of March 1995 and June 1998 are not really comparable. [3] Gross market values as a percentage of notional amounts. [4] Single-currency contracts only. [5] Adjustment for inter-dealer double-counting of gross market values in 1998 estimated on the basis of the 1995 triennial survey. [6] Not adjusted for double-counting.

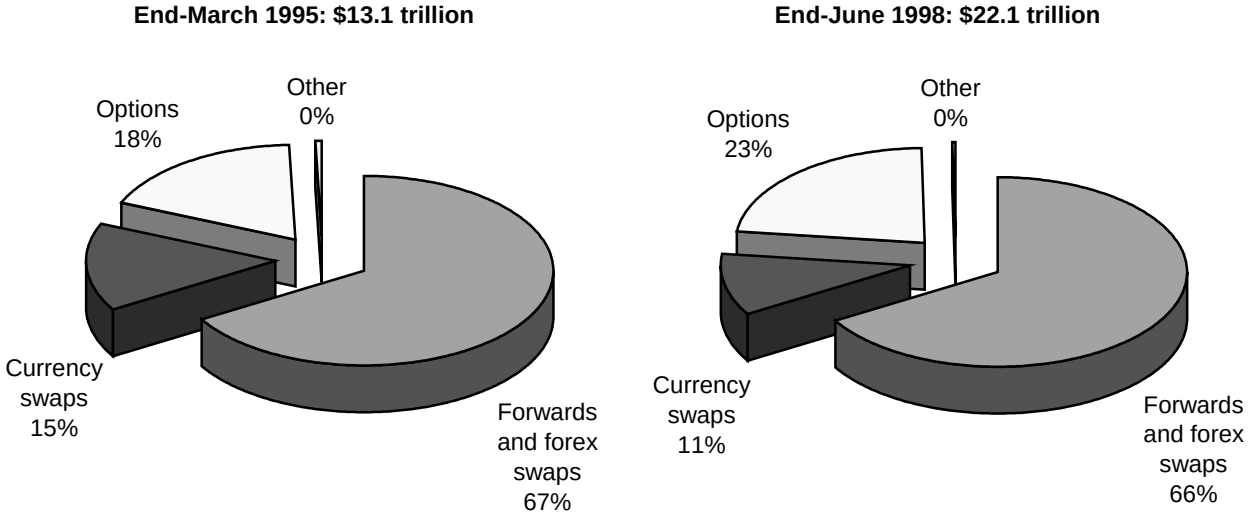
2.1 Foreign exchange contracts

While the bulk of foreign exchange contracts remained in the form of outright forwards and foreign exchange swaps, the fastest growth was in the area of options. As shown in Graph C-3, outright forwards and foreign exchange swaps accounted for 66% of notional positions in OTC foreign exchange derivatives at end-June 1998. This share of the market reflected an average growth rate of 19% a year since end-March 1995, as fast as the market as a whole. In the same period, options grew 28% a year to garner 23% of the market, reflecting in part a widespread use of leveraged strategies during the period. In comparison, currency swaps were sluggish, with only a 6% annual growth and an 11% market share. Relatively high capital charges related to counterparty risk exposures seem to have dampened the growth of such contracts.

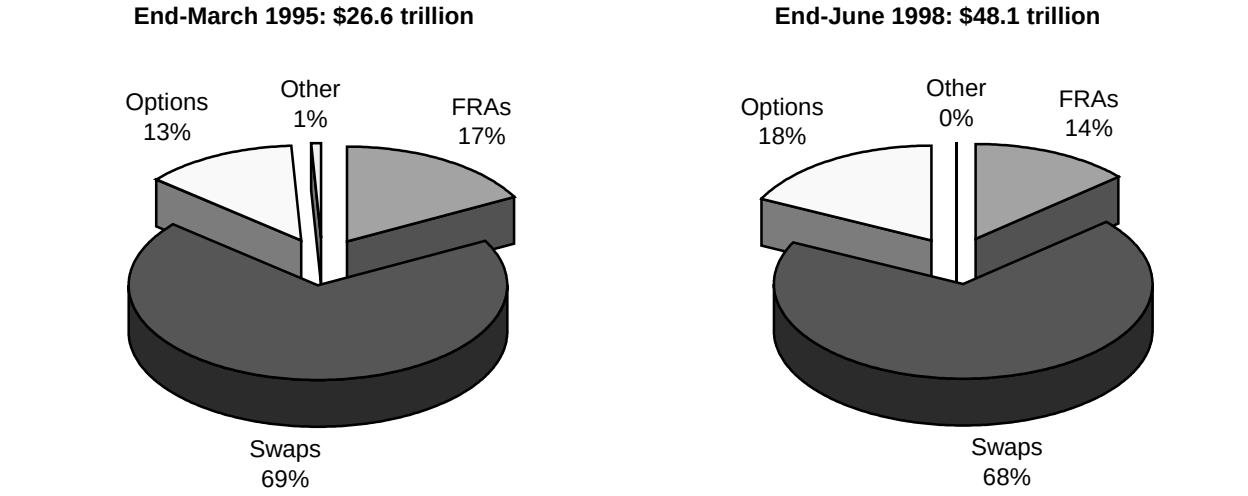
Graph C-3

Reported global net notional amounts outstanding in OTC derivatives markets by instrument

Foreign exchange contracts



Interest rate contracts



Reported gross market values for foreign exchange contracts at end-June 1998 reflected a period in which movements in the major currencies were relatively subdued. For these contracts as a whole, gross market values represented 4.5% of notional amounts, while the corresponding proportion at end-March 1995 was 8.0%. Differences in gross market values are consistent with foreign exchange market volatility in the two periods. In the early part of 1995, the foreign exchange market was buffeted by unusual volatility as the US dollar fell sharply against the Japanese yen and Deutsche mark. During the first half of 1998, by comparison, the market displayed moderate volatility, with the US dollar appreciating steadily against those two currencies. In a market where short-term contracts involving the US dollar were the norm, OTC foreign exchange derivatives became even more concentrated in short maturities and US dollar exposures. As shown in Table C-6, contracts with remaining maturities of a year or less accounted for 87% of notional amounts in this market at end-June 1998. These contracts made up 79% of the market at end-March 1995. In the same market, exposure to the US dollar made up one side of the contract 87% of the time among those contracts outstanding at end-June 1998. Contracts involving the Japanese yen and Deutsche mark were the next most common ones, with the yen involved in 28% and the mark in 24% of the contracts at end-June 1998.

Table C-6

Main features of reported positions in OTC foreign exchange derivatives markets[1]

Amounts outstanding in billions of US dollars

	End-March 1995[2]		End-June 1998	
	Notional amounts	**Gross market values**	**Notional amounts**	**Gross market values**
Total contracts	**13,095**	**1,048**	**22,055**	**982**
by counterparty				
other reporting dealers	7,121	533	8,852	385
other financial institutions	2,817	180	8,222	368
non-financial customers	3,157	335	4,981	229
by maturity[3]		..		..
up to one year	10,345	..	19,111	..
between one and five years	2,095	..	2,214	..
over five years	655	..	729	..
by currency[4]				
US dollar	10,739	..	19,169	914
Deutsche mark	3,297	..	5,271	145
Japanese yen	4,212	..	6,194	384
Pound sterling	..	..	2,723	72
French franc	..	..	1,638	43
Swiss franc	..	..	1,266	44
Italian lira	..	..	1,151	34
Other	7,942	..	6,698	328
Memorandum item:				
Exchange-traded contracts[5]	*119*	..	*103*	..

[1] Adjusted for inter-dealer double-counting. [2] In addition to changes in reporting months, differences in the reporting basis (locational reporting in 1995; worldwide consolidated reporting in 1998) and in the number of participating countries (26 in 1995; 43 in 1998) mean that the surveys of March 1995 and June 1998 are not really comparable. [3] Remaining maturity. [4] Counting both currency sides of every foreign exchange transaction means that the currency breakdown sums to 200% of the aggregate. [5] Sources: Futures Industry Association; various futures and options exchanges.

One of the most striking developments in the OTC market for foreign exchange derivatives has been the emergence of financial institutions other than reporting dealers as important counterparties. Table C-6 also reports dealers' positions against various types of counterparty. At end-June 1998, these dealers held $8 trillion against other financial institutions. These counterparties accounted for 37% of the total notional amount of OTC foreign exchange derivatives at that time, compared with 22% at end-March 1995. Many of these counterparties may have been leveraged funds, which have become major players in the OTC derivatives market. Note that this greater importance of other financial institutions has not been the case in the spot market. Derivatives transactions among the reporting dealers accounted for 40% of the market at end-June 1998, a much smaller share of the market than at end-March 1995. This does not necessarily mean that the inter-dealer share of the market has shrunk, because some of the non-reporting financial institution counterparties may have become non-reporting dealers themselves.[17]

[17] In particular changes in reporting procedure, and especially the change from locational to consolidated reporting, may have played a role in the shift of this counterparty structure.

Table C-7

Main features of global positions in OTC interest rate derivatives markets[1]

Amounts outstanding in billions of US dollars

	End-March 1995[2]		End-June 1998	
	Notional amounts	**Gross market values**	**Notional amounts**	**Gross market values**
Total contracts[3]	**26,645**	**647**	**48,124**	**1,354**
by counterparty				
other reporting dealers	15,732	351	21,477	543
other financial institutions	6,566	156	20,473	599
non-financial customers	4,347	139	6,174	212
by maturity[4]				
up to one year	11,724	..	20,176	..
between one and five years	11,457	..	19,010	..
over five years	3,464	..	8,938	..
by currency				
US dollar	9,307	183	14,349	346
Deutsche mark	3,376	54	6,993	209
Japanese yen	5,562	170	7,676	211
Pound sterling	..	..	3,846	70
French franc	..	..	3,720	126
Swiss franc	..	..	1,166	22
Italian lira	..	..	2,264	121
Other	8,400	240	8,110	250
Memorandum item:				
Exchange-traded contracts[5]	*9,722*	..	*13,107*	..

[1] Adjusted for inter-dealer double-counting. [2] In addition to changes in reporting months, differences in the reporting basis (locational reporting in 1995; worldwide consolidated reporting in 1998) and in the number of participating countries (26 in 1995; 43 in 1998) mean that the surveys of March 1995 and June 1998 are not really comparable. [3] Single-currency contracts only. [4] Remaining maturity. [5] Sources: Futures Industry Association; various futures and options exchanges.

2.2 Interest rate contracts

Swaps have dominated the market for OTC interest rate derivatives in the same way that outright forwards and foreign exchange swaps have dominated the foreign exchange side of the OTC market. As shown in Graph C-3, interest rate swaps accounted for 68% of notional positions in OTC interest rate contracts at end-June 1998, a share which is virtually the same as that at end-March 1995. Fixed-income options gained ground, increasing their share of notional positions at end-June 1998 to 18%. Forward rate agreements (FRAs) lost ground and were left with 14% of the market, in part because market participants appear to have preferred the liquidity of short-term exchange-traded interest rate futures.

In a reversal of the trend in the foreign exchange derivatives market, the market for OTC interest rate contracts moved toward longer maturities and away from the US dollar. As shown in Table C-7, interest rate contracts with more than five years remaining grew to 19% of notional positions at end-June 1998. The increased share of long-term contracts came at the expense of contracts with one year or less and contracts with between one and five years remaining. At the same time, the US dollar as the currency of denomination lost ground to the Deutsche mark, which increased its share from 13%

of notional positions at end-March 1995 to 15% at end-June 1998. The Japanese yen, however, remained the second most important currency in this market, after the US dollar.

As in the case of foreign exchange contracts, financial institutions other than reporting dealers became important counterparties in the OTC interest rate segment. These counterparties accounted for 43% of notional positions at end-June 1998, a share nearly as large as that of transactions among reporting dealers. Among these institutions, leveraged funds are likely to have been an important new class of counterparties. In the 1995 survey, the positions that reporting dealers had against one another accounted for 59% of the market. This share declined to 45% at end-June 1998.[18] Again, as in the case of foreign exchange contracts, this does not mean that inter-dealer positions became a smaller part of the market, because some of the other financial institutions may well have been taking positions as dealers in their own right, albeit as non-reporting ones.

[18] Nevertheless, as end-users shift market risk to market-makers, the latter entities can acquire large amounts of credit risk exposure to their counterparties.

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 43 countries for April and end-June 1998, and the first instalment of the new regular derivatives market reporting by central banks in the Group of Ten (G10) countries at end-June 1998. 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 1998, as reported by around 3,100 market participants in 43 countries on an individual unconsolidated basis (i.e. in-house deals and deals with other offices of the same institution were not netted out).
- The first instalment of the new regular derivatives market reporting covered notional amounts outstanding and gross market values of OTC derivatives positions at end-June 1998, as reported by 75 dealers in the G10 countries on a worldwide consolidated basis (i.e. 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).
- In addition, the triennial survey covered notional amounts outstanding and gross market values of OTC derivatives positions at end-June 1998, as reported by dealers in 26 non-G10 countries and non-regular reporters in eight G10 countries on a worldwide consolidated basis as defined above.

The data presented here are not immediately comparable with those of the previous triennial central bank survey in 1995, which was published by the BIS in May 1996. The main reasons are the following:

- Regarding foreign exchange and derivatives turnover, the previous survey was conducted in 26 countries, compared with 43 countries in 1998. However, the additional coverage provided was relatively minor (see Table B-5).
- Regarding amounts outstanding of derivatives, the previous survey was conducted in 26 countries on an individual locational basis (i.e. each market participant reported its individual market activity on an unconsolidated basis, with positions vis-à-vis own offices of the reporting institution not being netted out). In contrast, in 1998 data were collected in 41 countries on a worldwide consolidated basis as defined above. While the broader geographical coverage increased reported business activity, the netting of inter-affiliate transactions resulted in an even larger decrease in reported data (for data on the latter effect, see Table C-4).

1. Coverage

Data were collected on foreign exchange transactions and OTC derivative products according to the following broad market risk categories:

(a) for turnover

- foreign exchange transactions
- single-currency interest rate derivatives

(b) for amounts outstanding

- foreign exchange and gold contracts
- single-currency interest rate derivatives
- equity, commodity, credit and "other" derivatives

For turnover, the category of foreign exchange transactions covered both cash (i.e. 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 deals concluded (but not closed) during the month, 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 (i.e. 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 42 reporting countries). In addition, reporting institutions were asked to include in their reporting all arm's length market transactions, i.e. 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 1998, 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 18 to 23.

Turnover 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.

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 1998; the date of end-June was chosen to provide consistency with the new regular derivatives market statistics for the G10 countries, which were introduced at end-June 1998.

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 had 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, i.e. 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 value at current market prices provides 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 1998. 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 (i.e. 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, i.e. 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 commodities or commodity index exposure, whether they involved a joint exposure to commodities or any other market risk category (i.e. 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.

Foreign exchange spot and derivatives transactions were defined and categorised as follows:

Foreign exchange 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 (i.e. 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	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.

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.

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 (e.g. 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.

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.

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 (i.e. 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, i.e. 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 the institutions either in the same country or in another country, *which participated in the co-ordinated 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 (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.

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 (e.g. 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 with the same currency breakdown as in the previous surveys. As a result, data were provided separately for trading in domestic currency, US dollars and Deutsche marks against each other and against the following individual currencies and currency groups:

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

Other EMS currencies were defined to comprise Austrian schilling, Belgian franc, Danish krone, Finnish markka, Greek drachma, Irish pound, Italian lira, Luxembourg franc, Netherlands guilder, Portugese escudo, Spanish peseta and Swedish krona.

For other currencies, the country of issue provided information on turnover, while other countries tended to include these transactions in the residual categories. However, without information on the amount of transactions in a particular currency carried out by reporting dealers outside the country of issue, it is not possible to determine the amount of cross-border double-counting for that currency and to arrive at accurate estimates of global net turnover in it.

For *turnover* of single-currency interest rate contracts, a similar currency breakdown as for foreign exchange transactions was adopted:

domestic currency, Australian dollar, Canadian dollar, Deutsche mark, ECU, other EMS currencies French franc, Japanese yen, pound sterling, Swiss franc, US dollar, and other currencies.

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

Belgian franc, Canadian dollar, Deutsche mark, pound sterling, French franc, Italian lira, Japanese yen, Netherlands guilder, Swedish Krona, Swiss franc, US dollar, 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 (e.g. a notional amount outstanding in a currency for a given market risk category which is greater than or equal to 2% of the total notional amount outstanding in that market risk category). As a consequence, separate data are provided in Annex Tables E-38 and E-39 for the following additional currencies: Australian dollar, Danish krona, ECU, Finnish markka, Hong Kong dollar, New Zealand dollar, Norwegian krona, South African rand, Spanish peseta, Thai bhat and other EMS 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 French francs in exchange for Deutsche marks with a notional principal amount of $100 million reported $100 million in the French franc column, another $100 million in the Deutsche mark 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. For commodity, 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 (including gold), 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, i.e. 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, i.e. 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, i.e. 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, i.e. 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, i.e. gross market values net of local and cross-border double-counting.

In the case of *notional amounts outstanding in 1998*, 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, i.e. business net of any inter-dealer double-counting. For commodity contracts, for which no counterparty breakdown was collected in 1998, the adjustments for double-counting were estimated using the results of the 1995 survey.

In the case of *gross market values in 1998*, 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, i.e. dealers which do not participate in the new regular derivatives market statistics exercise 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, 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 for the first time, although without any counterparty breakdown, no adjustments were made for double-counting.

11. Gaps in reporting

Gaps in reporting stem from two sources: incomplete reporting (i.e. deals between two non-reporters) in the countries providing data, and less than full coverage of the range of countries in which the surveyed activity takes place. The second type of gap is 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, i.e. spot transactions, outright forwards and foreign exchange swaps (see Tables B-2). In the 1995 survey, gaps from incomplete reporting in the countries providing data were also estimated for turnover, notional amounts outstanding and gross market values of derivative instruments (see Tables C-1 and C-4). 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 (see Table B-1). 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 survey, 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 two latter types of data was almost complete due to the worldwide consolidated reporting of all major dealers in the participating 43 countries, and because of the lack of any information on missing coverage.

In the 1995 survey, an attempt was also made to estimate missing data on notional amounts outstanding and gross market values of outright forwards and foreign exchange swaps which were not collected from survey participants in the United Kingdom. This estimate was based on the ratio of 5% between the data on turnover and notional amounts outstanding of outright forwards and foreign exchange swaps as reported by the other 25 participating countries.

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.

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, which are shown in Table C-4.

A final and often very substantial complication of intertemporal comparisons arises from the movement of exchange rates. An attempt has therefore been made to exclude the effects of changes in exchange rates of deals in currencies other than the US dollar on reported business activity by recalculating the major aggregates at average April or end-June 1998 exchange rates (see Tables A-1, A-2 and A-3).

13. Annex tables

The detailed aggregated results of the 1998 Central Bank Survey of Foreign Exchange and Derivatives Market Activity and the first instalment of the new regular derivatives market statistics in the G10 countries at end-June 1998 are presented in the following annex tables in two separate sections: the first covering foreign exchange markets, i.e. turnover in traditional foreign exchange business, such as spot, outright forward and foreign exchange swap deals, and the second comprising OTC derivatives markets, i.e. turnover, notional amounts outstanding and gross market values of foreign exchange, interest rate, equity, commodity, credit-linked and other derivatives.

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 Deutsche mark 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 (other EMS currencies, 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 23 domestic currencies of those reporting countries whose currencies are neither shown separately nor included in the group of EMS currencies. 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.

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 (i.e. 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 (i.e. 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.

E. Statistical Annex Tables

1. Foreign Exchange Markets

Turnover in April 1998

By market segment, counterparty and currency

By country and currency

By country and counterparty

By country and maturity

By currency and maturity

Intertemporal comparison of turnover by country

2. OTC Derivatives Markets

Turnover in foreign exchange derivatives in April 1998

By instrument, counterparty and currency

By country and currency

By country and counterparty

Turnover in single-currency interest rate derivatives in April 1998

By country and counterparty

Intertemporal comparison of turnover by country

Amounts outstanding at end-June 1998

Notional amounts outstanding by instrument, counterparty and market risk factor

E-38 Foreign exchange derivatives

E-39 Single-currency interest rate derivatives

E-40 Equity-linked derivatives

E-41 Commodity, credit and other derivatives

Gross market values by instrument, counterparty and market risk factor

E-42 Foreign exchange derivatives

E-43 Single-currency interest rate derivatives

E-44 Equity-linked derivatives

E-45 Commodity, credit and other derivatives

Notional amounts outstanding by instrument, counterparty and remaining maturity

E-46 Foreign exchange derivatives

E-47 Single-currency interest rate derivatives

E-48 Equity-linked derivatives

Intertemporal comparison of amounts outstanding by market risk category

E-49 Foreign exchange derivatives

E-50 Single-currency interest rate derivatives

E-51 Equity-linked derivatives

Conventions used in the tables

- = reported to be nil

.. = not reported, suppressed for reasons of confidentiality or not meaningful

Owing to rounding and incomplete reporting of various breakdowns, the component items do not always sum to the total for the category in question.

The term “global” is only used to refer to data for which the BIS has made an adjustment for estimated gaps in reporting. The term “total” is used when referring to all reported transactions for a particular item or aggregate.

“Gross-gross”, or simply “gross”, refers to data for which no adjustment has been made for estimated double-counting; “net-gross” refers to data for which adjustments have been made for estimated local double-counting; and “net-net”, or “net”, refers to data adjusted for both local and cross-border double-counting.

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